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# STUDIES IN THE DERMAPTERA AND ORTHOPTERA OF COLOMBIA

## FIRST PAPER

DERMAPTERA AND ORTHOPTEROUS FAMILIES BLATTIDAE,  
MANTIDAE AND PHASMIDAE

BY MORGAN HEBARD

In undertaking the study of Dermaptera<sup>1</sup> and Orthoptera from Panama, we have found that a good beginning has been made for Costa Rica, to the north of that region, but for Colombia, to the south, all that appear in the literature are scattered descriptions of new species or records of previously known forms.

In consequence, in order to have a better understanding of this portion of the Colombian fauna, we have assembled all the material available from the country and present in the present paper the results for the Dermaptera and first three families of the Orthoptera.

The series at hand are much smaller than is desirable and it is patent that only a fraction of the Colombian species are represented. The material is, however, much more representative than any previously reported and furnishes striking evidence of the multitude of species which occur in that country, so varied in topography and environmental conditions.

The lack of previous study is shown by the fact that of the seventy species here considered, thirty-five are new to science, these including nine new genera. Two hundred Colombian specimens are recorded, in addition to which a number of exotic specimens of the same or allied species are discussed. We wish to extend our hearty thanks to Mr. James A. G. Rehn, of the Academy of Natural Sciences and to Mr. A. N. Caudell, of the United States National Museum, for the privilege of studying the Colombian material under their care.

We would note that the Colombian series is comprised of a few small collections and a number of individuals from widely

<sup>1</sup> This portion of that work has been published. Trans. Am. Ent. Soc., xliii, pp. 301 to 334, (1917).

scattered localities. The best of the small collections are from the Sierra Nevada de Santa Marta, in the north, on the coast of the Caribbean; from the Cordillera Oriental, in the department of Santander, in the central northern interior; from the valleys about the Cordillera Oriental, in Cundinamarca, in central Colombia, and from the Cordillera Occidental, in the department of Cauca, western Colombia. Little affinity is shown to the Panamanian fauna by these series, all from regions separated by decided natural barriers, or of widely different character, from low-lying Panama. It is probable, however, that in the lower portions of northern Cauca and eastern coastal Bolivar, the fauna is very similar to that of Panama. Hardly any material whatever is obtainable from the eastern lowlands in the Orinoco and Amazon drainage.

## DERMAPTERA

### PSALIDAE

#### PSALINAE

***Psalis apolinari***<sup>2</sup> new species (Plate XVI, fig. 1.)

This insect is apparently closely related to *P. peruviana* (Bormans).<sup>3</sup> The present female, when compared with the description of the unique male type of that species, is found to have the pronotum much shorter and more nearly quadrate and the tegmina decidedly broader. The caudal portion of the occiput is much paler in the present insect, but this may be due to individual variation. The scent glands are obsolete, the abdomen decidedly broader and the forceps decidedly longer, these features representing possibly only sexual differences.

The darkened knees and single heavier tooth on each arm of the forceps are striking features in both *peruviana* and *apolinari*.

<sup>2</sup> We take pleasure in naming this and other interesting species in the present paper for Hermano Apolinar Maria, Doctor of the Natural Sciences in the Instituto de la Salle, Bogotá, Colombia. It is through his kind cooperation that a large portion of the material treated in the present paper has been made available for study.

<sup>3</sup> 1880. *Anisolabis peruviana* Bormans, Anal. Soc. Españ. Hist. Nat., ix, p. 505. [♂, Central Peru.] Figured by Burr (Gen. Ins., Fasc. 122, Dermaptera, pl. iii, fig. 3, (1911)) as *Euborellia peruviana*. This generic assignment is untenable; it was based solely on the fact that the species has rudimentary tegmina.

*Type*.—♀; Pamplona, Santander, Colombia. Elevation, 7700 feet. May, 1916. From A. Maria. [Hebard Collection, Type No. 441.]

Size much smaller than in *P. americana*, close to that of *peruviana*; body robust, abdomen expanding and decidedly broadest meso-distad. Head with sutures distinct but represented by mere lines, occiput smooth and convex. Eyes small, much shorter than cheeks. Antennae with ten joints which are supplied with very few microscopic hairs; first joint very elongate and slender, nearly as long as width between antennal sockets; second joint minute, quadrate; third elongate, slender, three times as long as width, which is subequal throughout; fourth twice as long as greatest width; succeeding joints increasing in length and more slender distad, but all showing a weak convexity of the lateral margins, not tubular as is the third. Pronotum subquadrate, surface weakly convex proximad with a very fine medio-longitudinal sulcus; lateral margins weakly cingulate and feebly diverging caudad; caudal angles rectangular, more broadly rounded than the rectangular, sharply rounded cephalic angles; caudal margin transverse. Tegmina represented by small, broad ovate, lateral pads, extending very slightly beyond the caudal margin of the mesonotum. Wings absent. Metanotum with caudal margin broadly concave. Abdomen smooth, broadening to fifth dorsal segment, stink glands obsolete. Ultimate dorsal abdominal segment broad, smooth, with a weak medio-longitudinal sulcus becoming gradually heavier toward the caudal margin, along which margin, between the bases of the forceps, is a narrow, transverse, depressed area. Forceps heavy, triquetrous proximad, flattened distad and curving weakly to the acute apex; internal margin with a heavy tooth just beyond end of proximal third, succeeded by a few, irregular, decidedly smaller, blunt teeth. Penultimate ventral abdominal segment with distal margin nearly rectangular with apex broadly rounded. Limbs elongate and slender. Caudal metatarsus with ventral surface heavily supplied with hairs and with an internal and external row of rather closely set spines,<sup>4</sup> the external row not continued to distal portion of joint.

Length of body, 15.6; head, 3.8; pronotum, 2.9; exposed portion of tegmen, 1.8; forceps, 5.1; caudal femur, 4.3 mm. Width of occiput, 3.2; pronotum, 3; tegmen, 1.4; lateral portion of tegmen, .8; dorsal portion of tegmen, 1; abdomen at fifth dorsal segment, 5.6 mm.

<sup>4</sup> Lacking an internal fringe of lamellae as found in *Anisolabis maritima*, *Euborellia annulipes* and *scudleri*, or an internal fringe of very closely set hairs as in *Psalis americana* and *compacta* and in *Spandex percheron*. The armament of the ventral surface of the metatarsus may prove a valuable generic feature in the Psalinae. At the present time the genera *Psalis*, *Anisolabis*, *Spandex*, *Metalabis* and *Euborellia* offer a number of vexing problems. Without a monographic study of this group we would hesitate to erect a new genus for the present species with its distinctive metatarsal armament. When such work has been done, however, it is probable that this and other features will oblige generic separation.



Surface smooth and shining. Head deep chestnut, shading back of eyes to sanford's brown, the caudal portion of the occiput being solidly this color. Pronotum, tegmina, and remaining dorsal surface, including forceps, black with a chestnut luster, ventral surface of abdomen paler, showing a stronger chestnut coloration. Other underparts ochraceous orange. Limbs ochraceous orange, except at knees where they are very briefly but strikingly suffused with chestnut.

The type is unique.

***Psalis compacta*** new species (Plate XVI, figs. 2 and 3.)

This insect is readily distinguished from dark examples of *P. americana* having abbreviate and truncate tegmina, by the more robust build, shorter head, pronotum, tegmina and forceps, less hairy antennal joints and forceps in both sexes; the latter, though of the same general type, agreeing more closely with the type developed in *Euborellia annulipes* and other species of that genus.

In addition to other less striking features, *compacta* differs from *P. apolinari* in having quadrate tegmina, immaculate and much shorter limbs, pronotum with caudal margin less transverse and differently armed forceps.

In general appearance this insect is strikingly like an exceptionally large species of *Euborellia*, having the antennae not annulate and quadrate tegmina. Numerous features, however, of which the metatarsal armament is the most important, show the species to be a member of the genus *Psalis*.

*Type*.—♂; Soacha, Cundinamarca, Colombia. Elevation, 8800 feet. June 17, 1904. From A. Maria. [Hebard Collection, Type No. 442.]

Size and form much as in *apolinari*, but with abdomen, though broad, expanding somewhat less. Head proportionately not as large as in *americana* or *apolinari*, sutures represented by faint lines, occiput smooth and convex.<sup>5</sup> Eyes small, much shorter than cheeks. Antennae with (fourteen to sixteen in the series) joints moderately supplied with microscopic hairs, this covering not as heavy as in *americana*, much heavier than in *apolinari*; first joint elongate and slender, three-quarters as long as width between antennal sockets; second joint minute, length less than width; third elongate, slender, slightly over twice as long as greatest (distal) width; fourth slightly longer than greatest width; succeeding joints increasing in length distad, relatively shorter than in *americana* or *apolinari*. Pronotum subquadrate, surface weakly convex proximad where the medio-longitudinal sulcus is strongest; lateral

<sup>5</sup> In the series occasional individuals show brief and weak linear impressions parallel to and laterad of the medio-longitudinal suture.

margins cingulate and almost parallel; cephalic angles rectangulate and sharply rounded, caudal angles obtuse-angulate, rounding broadly into the broadly convex caudal margin. Tegmina smooth, dorsal surface subquadrate, sutural margins weakly overlapping, caudal margins of dorsal portions straight, transverse. Wings absent. Abdomen smooth, broadening to fifth dorsal segment, the two succeeding segments showing little difference in width; stink glands obsolete. Seventh dorsal abdominal segment with surface roughened by irregular longitudinal ridges laterad and there obtuse-angulate produced, with angle rather sharply rounded; eighth similar in this portion, but with angle more sharply rounded; ninth similar, but with angle subrectangulate and decidedly more sharply rounded: in these features much as in *americana* but with ultimate dorsal abdominal segment showing a longitudinally pinched and striate area instead of the single longitudinal and declivent caudad carina found in *americana*; ultimate dorsal abdominal segment elsewhere smooth, with a medio-longitudinal sulcus distinct only meso-distad.<sup>6</sup> Forceps heavy, briefly triquetrous proximad, flattened distad, with internal margin supplied with a few blunt, irregular teeth; sinistral arm almost straight to blunt and weakly incurved apex; dextral arm straight in proximal half, thence curving evenly and strongly sinistrad to the blunt apex,<sup>7</sup> thus crossing the sinistral arm distad. Penultimate ventral abdominal segment with distal margin forming an angle of over ninety degrees, the lateral portions straight and convergent to the apex which is broadly truncate, weakly and irregularly concave. Limbs proportionally shorter than in *americana*, much shorter than in *apolinari*. Caudal metatarsus with ventral surface thickly supplied with stiff hairs, with an internal and external row of rather widely spaced spines and an internal marginal fringe of very closely set, shorter hairs.

*Allotype*.—♀; same data as type. [Hebard Collection.]

Agrees with type except in the following features. Distal portion of abdomen slightly narrower, forceps and armament of internal margin similar except that the dextral arm shows no more curvature than the sinistral, both being weakly curved in distal portion. Apex of penultimate ventral abdominal segment not truncate, rather broadly rounded.

Surface smooth and shining. Head, pronotum and abdomen unicolorous, ranging from auburn (recessive) to black with a chestnut tinge (intensive). Antennae of same color as head, the proximal joints often slightly paler. Tegmina similarly colored, but in occasional examples of a slightly paler shade. Dorso-distal abdominal segments and forceps the same except in recessive examples where these portions are of a darker shade. Limbs immaculate, ochraceous-tawny.

<sup>6</sup> This is obsolete in specimens of the series before us.

<sup>7</sup> In *americana* this arm is somewhat offset at the base of the more strongly curved distal portion, this giving it a distinctly different general appearance.

	Measurements (in millimeters)						
	Length of body	Length of pronotum	Width of pronotum	Exposed length of tegmen	Dorsal width of tegmen	Length of caudal femur	Length of forceps <sup>a</sup>
♂							
Soacha, <i>type</i> . . . . .	16	2.8	2.6	1.7	1.7	2.9	3.7
Soacha, <i>paratype</i> . .	18	2.9	2.7	2.3	2	3.2	4.2
Soacha, <i>paratype</i> . .	18.3	3.1	2.8	2.1	2	3.2	4.3
♀							
Soacha, <i>allotype</i> . .	14.7	2.8	2.6	2.1	2.1	3.4	4.2
Soacha, <i>paratype</i> <sup>9</sup> .	13	2.5	2.2	1.6	1.7	2.8	3.7
Soacha, <i>paratype</i> .	17	2.9	2.6	2.1	2	3.3	4.5
Bogotá, <i>paratype</i> .	12.2	2.4	2.2	1.9	1.9	—	4.1
Bogotá, <i>paratype</i> .	13	2.8	2.7	1.9	1.9	3.2	4.3

In the series the head varies from 3 by 2.6 to 3.8 by 3 mm.; the greatest abdominal width ranges from 5.1 to 5.4 in the males and from 4.1 to 5.1 in the females.

*Specimens Examined:* 10; 3 males and 7 females.

Soacha, Cundinamarca, VI, 17, 1904, (from A. Maria), 3♂, 5♀, *type*, *allotype*, *paratypes*, [Hebard Cln.].

Bogotá, Cundinamarca, 8750 feet, (from A. Maria), 2♀, [Hebard Cln.].

#### SPONGOPHORINAE

##### **Spongophora forfex** Scudder

1876. *Spongophora forfex* Scudder, Proc. Bost. Soc. Nat. Hist., xviii, p. 259. [♂, doubtless subtropical or tropical America.]

Jimenez, Cauca, 1600 feet, VII, 1907, (M. G. Palmer), 1♂, 1♀, [A. N. S. P.].

The species of the present genus show astonishing variation in the development of the forceps. Whether such variation is also exhibited in the beading of the caudal margins of the dorsal abdominal segments, and on the ultimate dorsal abdominal segment, is at present not known. Until this problem is solved the number of valid species of *Spongophora* will remain in doubt.

At present we believe the pair at hand to represent a very depauperate condition of Scudder's species,<sup>10</sup> comparable with the depauperate material before us of *S. croceipennis*, recently recorded from Panama.<sup>11</sup>

<sup>8</sup> In the males the sinistral arm of the forceps is measured.

<sup>9</sup> The measured paratypes represent the extremes of the series before us.

<sup>10</sup> It would appear very likely, from consideration of Burr's description and figures of his *S. bormansi*, that his name is based on material showing an intermediate development of the present insect and should be assigned to synonymy here.

<sup>11</sup> Hebard, Trans. Am. Ent. Soc., xliii, p. 306, (1917).

The present male differs from the Panamanian males of *croceipennis* in having the exposed portion of the wings darker, pale mahogany red, the caudal margins of the fourth to seventh dorsal abdominal segments weakly beaded, the ultimate dorsal abdominal segment with minute scattered knobs distad and a concave row of larger knobs along the caudal margin between the forceps. The forceps show very slight curvature, have no distal tooth on the beaded ventro-internal margin, but do have a single, irregular, dorso-internal tooth as shown in the figures of *S. bormansi*.

## FORFICULIDAE

## FORFICULINAE

**Doru lineare** (Eschscholtz)

1882. *Forficula linearis* Eschscholtz, Entomogr., p. 81. [♀, Santa Catharina, Brazil.]

Choachi, Cundinamarca, 5900 feet, VI, 17, 1904, IX and XII, 1916, (from A. Maria), 2♂, 3♀, [Hebard Cln.].

These are the first specimens of *lineare* in the very large series of nearly two hundred specimens before us, in which the wings are rudimentary and entirely concealed by the tegmina. It is very exceptional to find both macropterous and brachypterous individuals in the same species of *Doru*, but three macropterous examples of the normally brachypterous *D. aculeatum* are also before us.<sup>12</sup> Other distinctive features make confusion with the normally brachypterous *D. luteipenne* impossible.

## OPISTHOCOSMIINAE

**NEOCOSMIELLA** new genus

This genus has the tegmina keeled to near the distal portion and the dorsal abdominal segments neither recurved or acute laterad. In other respects it appears to agree best with *Cosmiella*, a Malaysian genus.

The large, subrectangulate pronotum, nearly as broad as the dorsal width of the tegmina, is very different from the proportionately much smaller type found in the other American genera of the Opisthocosmiinae, *Dinex* and *Sarcinatrix*, which have the tegmina keeled but the sides of the abdominal segments without folds. In this pronotal type it agrees with *Neolobophora*, which

<sup>12</sup> Recorded by Hebard, Ent. News, xxviii, p. 322, (1917).

genus we believe will be placed in the Opisthocosmiinae, Burr's *Neolobophorinae* being, in our opinion, based on insufficient characters. The head with occiput not bilobate and tegmina with heavy keel in all but the distal portion, are features which readily separate *Neolobophora* and *Neocosmiella*.

*Genotype*.—*Neocosmiella atrata* new species.

*Description of Genus*.—Head short, convex, with twin impressions between eyes and with several weak concavities mesad on the moderately convex occiput. Pronotum ample, subquadrate, nearly as broad as head, not conspicuously narrower than width across tegmina. Tegmina with a well-developed dorso-lateral keel to near the distal margin. Abdomen with stink gland of third dorsal segment weakly developed, that of fourth segment conspicuous; sides of dorsal segments simple; ultimate segment smooth, transverse, very feebly narrowing and declivent distad. Male forceps elongate, without a dorsal tooth.

***Neocosmiella atrata*** new species (Plate XVI, fig. 4.)

The present species has no near relatives. The tegmina are very similar in contour and outline to those of the Javan *Sken-dyle aptera* (Verhoeff), as figured by Burr.<sup>13</sup>

Some similarity to *Neolobophora ruficeps* is found in pronotal amplitude, tegminal outline, all abdominal features and general curvature of forceps, but that species differs very widely in coloration, bilobate occiput, smooth tegmina without keels, forceps without a proximo-internal tooth and with proximal weak curvature extending nearly to the mesal point.

*Type*.—♂; Pamplona, Santander, Colombia. Elevation 7700 feet. May, 1916. From A. Maria. [Hebard Collection, Type No. 443.]

Size decidedly larger than *Dinex americanus*, pronotum and proximal portion not as slender, but form very elongate. Head of same type as in *Dinex americanus* but more elongate, with eyes less protuberant and slightly shorter than cheeks.<sup>14</sup> Antennae with first joint heavy, elongate, as long as width between antennal sockets; second joint minute, scarcely longer than wide; succeeding joints elongate, rod-like, increasing in length distad. Pronotum subquadrate; surface irregularly moderately convex; cephalic angles rectangulate, rather sharply rounded but not produced laterad in minute points as in *Neolobophora ruficeps* and *Dinex americanus*; lateral margins very feebly

<sup>13</sup> Gen. Ins., Fasc. 122, Dermaptera, pl. 9, fig. 12a, (1911).

<sup>14</sup> See generic description for additional characters of head, pronotum, tegmina, abdomen and forceps.

convex, subparallel; caudal angles rectangulate, broadly rounded; caudal margin broadly convex. Tegmina about twice as long along humeral trunk as dorsal width; dorsal surface deplanate, rugulose, separated from less heavily punctulate lateral surface by a heavy dorso-lateral keel, which disappears before the distal margin; angle at costal margin acute but broadly rounded, distal margin thence oblique to sutural margin. Abdomen widening very slightly and gradually to sixth dorsal segment, then narrowing a little more sharply to apex. Pygidium inconspicuous, declivent, surface weakly convex. The latero-ventral angles of the ultimate dorsal abdominal segment project as a minute tooth on each side beneath the base of the forceps. Forceps cylindrical, very elongate and slender, smooth but armed with a large proximo-internal tooth just beyond the pygidium, feebly bowed in proximal third, thence almost straight but weakly curved to immediate incurved apex, with internal margin very feebly serrulate. Penultimate ventral abdominal segment with lateral margins straight, convergent, rounding broadly into mesal third of free margin which is feebly concave. Limbs elongate and slender.

Length of body, 10.7; head, 2.3; pronotum, 1.9; exposed portion of tegmen along humeral trunk, 1.9; exposed portion of tegmen along sutural margin, 1.7; forceps, 8.9; caudal femur, 3.3 mm. Width of head, 1.9; pronotum, 1.9; abdomen at widest point, 2.7 mm.

Head, pronotum, tegmina and abdomen shining black. Antennae deep chestnut, excepting first joint which is shining black. Forceps in brief proximal portion shining black, remaining portions deep chestnut. Limbs shining black, except distal portion of tibiae and the tarsal joints which are auburn.

The type of this remarkable insect is unique.

## ORTHOPTERA

### BLATTIDAE

#### PSEUDOMOPINAE

#### PLATYLESTES<sup>15</sup> new genus

This genus, a member of the Group Blattellites, shows relationship to *Latiblattella* Hebard in the Type B armament of the ventro-cephalic margin of the cephalic femora, which bears three heavy, elongate distal spines, the very broad form and general structure of male subgenital plate. Other features are very distinct, agreeing instead with *Neoblattella* Shelford; the most important of these are the tegmina which have the discoidal sectors longitudinal and the dorsal surface of the male abdomen which is unspecialized.

*Genotype*.—*Platylestes colombiae* new species.

*Description of Genus*.—Sexes similar, except that in the female the pronotum and abdomen is more ample. Size rather large,

<sup>15</sup> From *πλατύς* = broad and *ληστὴς* = plunderer.

form very broad for the group. Head with eyes well separated; lateral margins of face distinctly converging ventrad. Maxillary palpi with distal joint slightly shorter than penultimate joint. Tegmina moderately chitinous; discoidal sectors few (5 to 6), longitudinal. Wings with costal veins not clubbed, becoming obsolete toward costal margin; intercalated triangle small but apparent. Dorsal surface of male abdomen unspecialized. Cerci ensiform. Subgenital plate of male fusing and specialized with styles. Subgenital plate of female short, showing a very short medio-longitudinal distal cleft. Cephalic femora with ventro-cephalic margin armed with (6 to 9) long stout spines (of which one or two distad are sometimes decidedly shorter than the others), succeeded distad by a row of minute, well-spaced, piliform spines, terminating in three heavy, elongate distal spines in increasing ratio. Ventro-caudal margin of cephalic femora distad, and ventral margins of median and caudal femora supplied with elongate, moderately stout spines. First three tarsal joints supplied distad with small pulvilli, brief ventral surface of fourth joint occupied by a pulvillus.<sup>16</sup> Tarsal claws unspecialized. Arolia present.

**Platylestes colombiae** new species (Plate XVII, figs. 1 and 2.)

Superficially the present insect suggests a large and very broad form of *Latiblattella*. The shorter, ensiform cerci are remarkable.

*Type*.—♂; La Palmeta, Santander, Colombia. Altitude, 7500 feet. July 15 to 20, 1916. (M. A. Carriker Jr.) [Hebard Collection, Type No. 464.]

Size rather large for group, form very broad. Head with interocular space three-fifths that between antennal sockets; ocelli obsolete; entire face flattened, weakly convex; very small circular areas, with surfaces feebly convex, occur meso-ventrad of and adjacent to antennal sockets. Maxillary palpi with distal joint large, slightly shorter than penultimate joint and rather thickly supplied with stiff hairs. Pronotum very feebly and evenly convex; greatest width near caudal margin; transparent lateral portions not strongly declivent; cephalic margin above head and caudal margin truncate, lateral margins feebly convex and distinctly divergent to the broadly rounded latero-caudal angles. Tegmina broad, showing slight reduction, not reaching apices of cerci; wings showing distinct reduction: see generic description for other features. Supra-anal plate small, lateral margins feebly convex, strongly convergent to distal

<sup>16</sup> This is the type found in both *Latiblattella* and *Neoblattella*; the former genus has been unfortunately assigned otherwise in Hebard, Mem. Am. Ent. Soc., 2, pp. 12 and 18, though correctly characterized in the original description.

portion which is bilobate. Cerci short, ensiform, tapering to acute apex, subdeplanate dorsad, joints distinct but feebly moniliform. Internal genitalia complex. Subgenital plate small, asymmetrical; with two broad, elongate inset plates (the styles), the surfaces of which slope dorso-laterad, these styles directed dorso-mesad with apices nearly attingent, thus forming the distal surface of the subgenital plate, beneath which lies the median rotundato-trigonal produced portion of the plate; the sinistral style is decidedly the smaller and leaves a distinct gap between its ventral margin and the median produced portion of the plate. Limbs and armament as given in generic description.

*Allotype*.—♀; same data as type. [Hebard Collection.]

Very similar to male in general appearance, but with abdomen considerably heavier and as a result slightly surpassing the tegminal apices. Interocular space nearly as wide as that between antennal sockets. Pronotum similar to that of male except that the width of the cephalic portion is greater, giving it a more rotundato-quadrate appearance. Supra-anal plate small, triangular, but decidedly angulate-emarginate at apex with apices of lateral productions rounded. Subgenital plate ample, convex, short, briefly upturned distad, with a brief medio-longitudinal cleft; free margin convex proximad, then broadly obtuse-angulate concave beneath bases of cerci, thence evenly convex.

<i>Measurements (in millimeters)</i>					
♂	Length of body	Length of pronotum	Width of pronotum	Length of tegmen	Width of tegmen
<i>Type</i> . . . . .	16	4.8	6.8	12.2	4.9
<i>Paratype</i> . . . . .	15.4	4.8	6.7	12.1	4.7
♀					
<i>Allotype</i> . . . . .	16.7	5	6.7	12	4.8

Head ochraceous-tawny, washed with cinnamon brown, or entirely cinnamon, brown. Pronotum with disk marbled, sudan brown to ochraceous-tawny, transparent lateral portions tinged with ochraceous-tawny. Tegmina transparent, ochraceous-tawny, the humeral trunk briefly suffused proximad with prout's brown. Wings transparent, whitish like ground glass, veins faintly tinged with brown. Abdomen, cerci and limbs ochraceous-tawny, tinged with cinnamon brown on disto-dorsal portion in males; female darker, possibly discolored.

In addition to the type and allotype, a single paratypic male, bearing the same data, is at hand.

***Neoblattella carrikeri***<sup>17</sup> new species (Plate XVII, figs. 3, 4, 5 and 6.)

The male of this insect is the most attenuate, and has the proportionately longest tegmina, of any American form of the Group Blattellites. The highly specialized male subgenital plate

<sup>17</sup> We name this species in honor of Mr. M. A. Carriker Jr., who collected these specimens and also the valuable series from the Magdalena and Santander regions recorded in the present paper.



and styles will probably show striking differences from any other closely related species.

The female closely resembles that sex of *N. pellucida* (Burmeister) in dorsal appearance, size of pronotum, length and shape of tegmina and dorsal coloration, but differs widely in the much more elongate maxillary palpi with very short distal joint, more slender limbs and the inconspicuously marked ventral surface of the abdomen.

With other species *carrikeri* would appear to form a unit which we would term the Carrikeri Group, the species distinguished by their attenuate form and elongate tegmina and limbs; the elongate tegmina conspicuous only in the males of some of the species. In this Group, from the descriptions, we would place *azteca* and probably *alaris*, both of Saussure and Pictet, and *titania* of Rehn, from study of the type; the order being *titania*, *alaris*, *azteca* and *carrikeri*, the first two species having the organs of flight considerably shorter than in the others.

*Type*.—♂; San Lorenzo, Sierra Nevada de Santa Marta, Magdalena, Colombia. Elevation, 7000 to 8300 feet. August 23, 1913. M. A. Carriker Jr. [Hebard Collection, Type No. 443.]

Size medium, large for the Carrikeri Group; form slender. Interocular space wide; ocellar spots barely indicated. Lateral margins of genae straight, parallel. Maxillary palpi very elongate; third joint very elongate and slender, distinctly longer than width between antennal sockets, fourth almost as long, fifth (distal) joint slightly more than half as long as fourth, moderately enlarged, oblique truncate to near its base. Pronotum with surface almost perfectly deplanate, showing very feeble convexity meso-cephalad and along the caudal margin, and with undulations on the slightly impressed disk; cephalic and caudal margins truncate, feebly convex, the caudal margin much the broader; lateral margins convex; greatest width at mesal point. Tegmina very delicate and elongate; with (7 sinistral, 8 dextral) longitudinal discoidal sectors; cross-veinlets scarcely apparent; minute colorless nodes widely scattered distad over the surface on the veins, these the bases of minute microscopic hairs. Wings very delicate; proximal (7 and 8) costal veins heavily clubbed distad with succeeding (2) veins weakly clubbed; ulnar vein with (7) branches complete; intercalated triangle very small. Supra-anal plate triangularly produced with apex rounded, about twice as broad as long. Concealed genitalia: a very slender and elongate, dark, slightly outwardly curved aciculate process is apparent with apex resting in cleft above the sinistral style. Subgenital plate roughly quadrate, scoop-shaped; lateral raised portion with dorsal margins weakly concave, the sinistral slightly the longer, leaving a median portion with oblique distal margin forming about one-third of the free margin, weakly

produced sinistrad, with disto-sinistral angle produced in a minute, delicate, subquadrate plate; these three portions are separated by very deep and narrow clefts, in depth about half the distance between their bases, at which bases are situated the elongate, cylindrical styles, the sinistral as long as the sinistral cleft, the dextral very slightly the longer, each with dorsal surface thickly supplied with minute spines directed caudad and with apex very feebly enlarged and incurved. Limbs very elongate and slender. Cephalic femora with ventro-cephalic margin supplied with a series of slender, moderately elongate spines, which decrease gradually in length and size to minute spinulae before the two large and elongate distal spines, of which the more distal is the longest. Tarsi extremely long, four proximal joints each supplied with a small distal pulvillus which is produced to an acute apex. Moderate arolia present. Tarsal claw specialized<sup>18</sup>; broad to near uncinat apex, with internal margin of flange minutely serrulate, the three distal serrulations largest.<sup>19</sup>

*Allotype*.—♀; same data as type. [Hebard Collection.]

Agrees with male in form of head, maxillary palpi, microscopic nodes on tegmina, armament of limbs and specialization of tarsal claws. Pronotum more ample, surface showing moderate convexity. Tegmina and wings very much shorter, the veins all very much more weakly developed. Supra-anal plate triangularly produced, with apex strongly angulato-emarginate at an angle of somewhat less than ninety degrees. Subgenital plate scoop-shaped, the meso-distal portion not strongly produced; lateral margins broadly convex to near bases of cerci, there broadly concave, meso-distal portion with margin broadly convex.

*Measurements (in millimeters)*

	♂	Length of body	Length of pronotum	Width of pronotum	Length of tegmen	Width of tegmen
San Lorenzo, <i>type</i> . . . . .		12.7	3.1	4	17.9	4.9
	♀					
San Lorenzo, <i>allotype</i> . . . . .		10.8	3.2	4.4	11.5	3.7
San Lorenzo, <i>paratype</i> . . . . .		12.1	3.2	4.4	11.7	3.8

<sup>18</sup> A differently specialized tarsal claw has recently been noted for the genus *Plectoptera*. Hebard, Mem. Am. Ent. Soc., No. 2, p. 251, (1917).

<sup>19</sup> This type of specialization is clearly a character of specific importance in the present genus, but largely of degree, the differences in the various species showing that it can not be used as a constant generic feature. In *Neoblattella* the highest specialization is noted in *nahua* and the genotype *adpersicollis*, in which the internal flange of the claw is heavily serrulate throughout; in *fasciata*, *conspersa* and *fraterna* the serrulations are heavy distad; in *pellucida* moderate distad, while in *fratercula* and *titania* they are subobsolete. In the closely allied genus *Cariblatta*, the majority of the species show this flange with serrulation of its margin subobsolete, but in *punctipennis* and *imitans* weak distal serrulation of the internal margin of the flange is found, while in *aediculata* it is decided. Species of the genera *Euthlastoblatta*, *Aglaopteryx*, *Dendroblatta*, *Latiblattella*, *Supella* and *Blattella* have been examined and are found to show no specialization of the tarsal claws.

General coloration of male pale ochraceous-tawny, the lateral portions of pronotum and tegmina transparent, tinged with ochraceous-buff. Head ochraceous-buff with interocular area suffused with prout's brown, three pairs of suffused flecks of this color (remnants of transverse bands) below on the face and a fleck of this color below each antennal socket. Underparts and limbs clear ochraceous-buff.

Females similarly colored but with interocular area paler, in one scarcely suffused, in the other weakly clouded with ochraceous-tawny; facial flecks as pronounced as in male. This sex also has the tegmina more heavily suffused with ochraceous-buff in median section, beyond this hardly at all suffused and ventral surface of the abdomen ochraceous-buff with a lateral marginal suffusion of chestnut, becoming broader and deep shining chestnut-brown along the free margin of the subgenital plate.

In addition to the type and allotype, a single paratypic female, bearing the same data, is at hand.

***Ischnoptera morio*** Burmeister

1838. *Ischnoptera morio* Burmeister, Handb. Ent., ii, Abth. ii, pt. i, p. 500. [Colombia.]

Choachi, Cundinamarca, 5900 feet, VIII, 1916, (from A. Maria), 1 ♀, [Hebard Cln.].

Length of body 17.1; pronotum, 4.8; tegmen, 20.9; caudal tibia, 6.2 mm. Width of pronotum, 6.2; tegmen, 5.9; abdomen, 8 mm.

***Ischnoptera apolinari*** new species (Plate XVI, figs. 6 and 7.)

The present species is widely distinct from any of the described forms of the genus. With *I. pallipes*, *pampaconas*<sup>20</sup> and *colombiae*,

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<sup>20</sup>***Ischnoptera pallipes*** (Scudder) (Plate XVI, fig. 5.)

1869. *Phyllodromia pallipes* Scudder, Proc. Bost. Soc. Nat. Hist., xii, p. 342. [♂, Napo or Marañon, [Upper Amazon].]

The description of this insect is insufficient. The dried alcoholic type before us shows differences from *I. apolinari* in the decidedly longer, uniform blackish chestnut pronotum and less delicate wings with veins blackish chestnut.

The genitalic features are distinctive. Supra-anal plate of same form as in *apolinari*, but with disto-dorsal surface heavily supplied with hairs and ventral surface unspecialized and not hairy. Subgenital plate with margins rather strongly concave to the median produced portion, which is not large, subquadrate, with distal angles rounded, the disto-dextral angle very broadly rounded; sinistral style situated at sinistral base of production, small, simple, cylindrical, feebly curved dextrad, tapering to the sharply rounded apex; dextral style (Plate XVI, fig. 5a) situated at disto-dextral angle of production, proximal portion developed into a large, globose, smooth swelling, from which dorso-caudad projects caudad the rather stout, distal cylindrical portion, the apex

the latter here described, this species represents a group of rather large, dark species having very elongate tegmina in both sexes, pronotum unicolorous or with narrow pale lateral margins, limbs pale and male supra-anal plate produced but showing no sub-chitinous area. We would call this the Apolinari Group and place it after the Rufa Group in linear arrangement.

Compared with *colombiae*, known only from the male sex, males of *apolinari* are found to be identical in every detail of structure and coloration except that the limbs are proportionately longer and the genitalia highly distinctive.

*Type*.—♂; Choachi, Cundinamarca, Colombia. Elevation, 5900 feet. July, 1915. From A. Maria. [Hebard Collection, Type No. 444.]

Size medium for the larger species of the genus, form slender. Interocular space narrow, hardly one-third ocular depth, about three-fifths interocellar width. Ocelli large, surface flattened, margins at interocellar area slightly raised and narrowly convex. Maxillary palpi rather short, hairy; particularly fourth and fifth joints; fourth joint shorter than third, fifth (distal) joint about as long as third, moderately enlarged, with ventral margin weakly convex. Tegmina comparatively narrow, with numerous (9 and 11) weakly radiating discoidal sectors; dextral tegmen with diagonal channel strongly impressed and conspicuous. Wings as normal for the genus<sup>21</sup>; ulnar vein with (5) proximal incomplete branches and (2) complete distal branches. Dorsal surface of abdomen with sixth and seventh segments specialized, typical for the genus.<sup>22</sup> Supra-anal plate well produced, chitinous throughout; free margins briefly straight, oblique and strongly convergent to just beyond cercal bases, thence very feebly convex and very feebly convergent to the broadly rounded latero-caudal angles, the distal margin between these feebly convex but showing a very weak mesal obtuse-angulate emargination, the produced portion thus

of which is bluntly rounded, the entire surface of this distal portion heavily supplied with minute spines.

Length of body 14; pronotum, 3.8; tegmen, 16.2. Width of pronotum, 4.5 mm.

### **Ischnoptera pampaconas** Caudell

1913. *Ischnoptera pampaconas* Caudell, Proc. U. S. Nat. Mus., xliv, p. 348.

[♀, Pampaconas River, Peru.]

This species belongs to the Apolinari Group, though not as elongate as the other species here discussed. From examination of the type we would note that the supra-anal plate in that female is distinctively rotundato-produced between the cerci. The pale borders of the costal margins of the tegmina are particularly striking in the costal half of the marginal fields.

<sup>21</sup> Described in Trans. Am. Ent. Soc., xlii, p. 339, (1916).

<sup>22</sup> See Mem. Am. Ent. Soc., No. 2, p. 62, (1917).

formed about twice as broad as long, its form weakly suggesting bilobation; the plate bears latero-distad scattered hairs on the dorsal surface and a fringe of stouter hairs directed cephalad near the distal margin on the ventral surface; proximad of these the ventral surface is raised dextrad in a heavy ridge from which projects a stout, heavy, rounded process directed meso-proximad and armed with a few short, sharp teeth. Cerci slender with (11 to 12) well-defined joints. Concealed genitalia: the very brief, recurved genital hook is situated sinistrad, from beneath the dextral projection of the supra-anal plate projects a narrow, chitinous lobe, while along its inner surface is a slender, elongate, channeled, chitinous projection, surrounded by a soft whitish mantle. Subgenital plate roughly subquadrate, scoop-shaped; sinistral portion curled dorsad with margin concealed, distal margin broadly concave, oblique and moderately produced dextrad, there rounding into the dextro-lateral margin which is broadly concave distad, thus forming a bluntly triangular production with surface moderately reflexed and concave; proximo-dextral portion curled dorsad, the margin concealed. Mesad in the sinistral concavity of the distal margin is situated a slender, straight, gently tapering, hairy style with apex rounded and dorsal surface supplied with a few minute, but rather stout, teeth directed distad; at the apex of the roundly triangular dextral production is situated a short, heavy, blunt, conical style, supplied distad with a few blunt teeth. Limbs elongate, their armament, pulvilli and arolia normal<sup>23</sup>; the ventro-cephalic margins of the cephalic femora having a series of heavy proximal spines and a series of minute, distal, closely set, piliform spines.

*Allotype*.—♀; same data as type, but taken August, 1916. [Hebard Collection.]

Very similar to male, differing in the following features. Size somewhat larger, form generally similar but with abdomen broader. Tegmina and wings fully as elongate. Dorsal surface of abdomen unspecialized. Supra-anal plate with lateral margins straight, weakly oblique to median two-fifths of the plate, where a subrectangulate production, about twice as wide as long, occurs, with distal margin broadly convex, this production suggesting a simplified miniature of the homologous production in the male. Subgenital plate broadly scoop-shaped, lateral margins straight, parallel in very brief proximal portion, thence rounding broadly into the very broadly and evenly convex distal margin.

*Measurements (in millimeters)*

♂	Length of body	Length of pronotum	Width of pronotum	Length of tegmen	Width of tegmen	Length of caudal femur
Choachi, <i>type</i> . . . . .	13.5	3.5	4.6	17	4.6	6.4
Choachi, <i>paratypes</i> . . . . .	15.8–16.7	3.6–3.6	4.6–4.6	17–17.2	4.5–5	6.2–6.3
♀						
Choachi, <i>allotype</i> . . . . .	16.8	3.9	4.9	18.5	5.2	6.4

Head shining blackish chestnut brown, mouthparts paler, ocelli conspicuously light buff. Pronotum shining blackish chestnut brown with lateral margins narrowly translucent warm buff, this continued without interruption

<sup>23</sup> See Mem. Am. Ent. Soc., No. 2, p. 62, (1917).

around the cephalic margin, there being still narrower and somewhat suffused. Tegmina shining deep chestnut brown, translucent when spread, with marginal field narrowly bordered with translucent warm buff; portion of dextral tegmen concealed when at rest hyaline but embrowned. Wings hyaline faintly embrowned except in intercalated triangle, with a very faint iridescent luster, veins and entire area of costal veins chestnut brown. Body, abdomen, except dorso-proximad where the abdomen is paler, and cerci chestnut brown. Limbs light buff, proximal portion of coxae chestnut brown, tibiae and tarsi tinged with brown.

In addition to the type and allotype, a single paratypic male from the same locality is at hand.

**Ischnoptera colombiae** new species (Plate XVI, figs. 8, 9 and 10.)

This insect is so similar to *I. apolinari* that careful comparison shows the majority of features exactly as given for that species. We therefore describe below only the characters separating these species.

*Type*.—♂; Valle de Las Pappas to San Augustin, Tolima, Colombia. April 6, 1912. [Hebard Collection, Type No. 214.]

Interocular space moderately wide, three-fifths the ocular depth, four-fifths the interocellar width. Internal margins of ocelli forming a sharply rounded angle with interocellar area, not raised. Maxillary palpi shorter than in *apolinari*, with fifth (distal) joint slightly longer than third. Supra-anal plate with production of similar type but uniformly less heavily chitinous, this portion slightly longer than its proximal breadth; ventral surface lacking a projection. Concealed genitalia: an elongate, heavy, moderately chitinous plate is situated dextrad and directed caudad, adjacent to which mesad are two very elongate and slender chitinous projections, the longest of which terminates in several long contiguous spines. Subgenital plate very short, scoop-shaped, surface entirely convex; free margin convex except meso-sinistrad where a moderate obtuse-angulate emargination occurs, the convexity strongest meso-dextrad where the production is greatest. Sinistral style situated in sinistral angulate-emargination, elongate, decidedly stouter than this style in *apolinari*, flattened cylindrical, feebly sinuous, tapering slightly to the rounded apex, unarmed. Dextral style situated on dorsal surface of distal margin sinistrad on dextral production, very small, slender, cylindrical, unarmed, hardly tapering to the apex, which is directed sinistrad. Limbs short, strikingly shorter than in *apolinari*.

Length of body, 12.6<sup>24</sup>; pronotum, 3.1; tegmen, 17; caudal femur, 3.7 mm. Width of pronotum, 4.1; tegmen, 4.4 mm.

Coloration throughout as in *apolinari* except that the pronotum is slightly less dark, shining dark chestnut brown, with narrow warm buff marginal marking more sharply defined cephalad, but very narrowly interrupted meso-cephalad. Limbs slightly darker than in *apolinari*, general coloration ochraceous-buff, but similarly marked.

The type is unique.

<sup>24</sup> The abdomen in this specimen is decidedly drawn in.

**Xestoblatta carrikeri** Hebard

1916. *Xestoblatta carrikeri* Hebard, Trans. Am. Ent. Soc., xlii, p. 374, pl. xix, figs. 5, 6 and 7. [♂, ♀ : Cincinnati, [Sierra Nevada de] Santa Marta, [Magdalena,] Colombia.]

This remarkable species was described from a pair from the collections at present under consideration. No further specimens of this insect have been obtained.

## NYCTIBORINAE

**Nyctibora obscura** Saussure

1864. *N[yc]tibora obscura* Saussure, Rev. et Mag. de Zool., 2e sér., xvi, p. 316. [♀, Brazil.]

Cincinnati, Sierra Nevada de Santa Marta, Magdalena, Colombia, 4000 to 5000 feet, VII, 1913, (M. A. Carriker Jr.), 1 ♀, [Hebard Cln.].

Length of body 24.5; length of pronotum, 7.15; width of pronotum, 10.7; length of tegmen, 26.3; width of tegmen, 10.5 mm.

**Eunyctibora nigrocincta** (Shelford)

1907. *Nyctibora nigrocincta* Shelford, Ann. Mag. Nat. Hist., (7), xix, p. 37. [♂, ♀, Colombia.]

Bogotá, Cundinamarca, 8750 feet, (from A. Maria), 1 ♀, [Hebard Cln.].

**Paratropes biolleyi** Saussure and Zehntner

1893. *Paratropa biolleyi* Saussure and Zehntner, Biol. Cent.-Amer., Orth., i, p. 60. [♀, Costa Rica; ♂, Bugaba, Panama.]

Cauca, Colombia, 1 ♀, [Academy of Natural Sciences of Phila.].

This specimen differs from material of *P. bilunata* Saussure and Zehntner at hand, in having the pronotal marking and the borders of the tegmina uniform translucent antimony yellow.

## EPILAMPRINAE

**Epilampra shelfordi**<sup>25</sup> new species (Plate XVIII, fig. 1.)

This insect belongs to an apparently exclusively South American group of the genus, distinguished by the tegmina being not only punctulate, but with a maculate and marbled ground coloration difficult to describe, but giving the insects an unusually richly colored appearance.

<sup>25</sup> We name this beautiful insect in honor of that distinguished student of the Blattidae, R. Shelford, whose excellent work was so abruptly terminated by his untimely death.

To this group belong *E. conspersa* and *E. agathina*, of which species single specimens are at hand. More material may show these forms to be generically distinct.

The present species has the tegmina narrower than in *conspersa*, less strikingly marmorate, with an irregular clustering of black dots mesad which are not found in that species, neither is the area of the costal veins solidly colored or as dark, showing only numerous irregular dark punctae. The coloration of *agathina*, which is a larger and heavier insect, is much darker and of a distinctly different type.

*Type*.—♂; El Credo, Cauca, Colombia. Elevation, 1000 feet. February, 1907. (M. G. Palmer.) [Academy of Natural Sciences of Philadelphia, Type No. 5345.]

Size small for the group, medium for the genus; form moderately broad. Interocular space wide, nearly as wide as interocellar space, much wider than space between antennal sockets; face flattened; ocelli large, well defined, with flattened surfaces forming an obtuse-angulation with plane of face. Pronotum convex, lateral portions moderately declivent latero-cephalad, greatest width mesad; cephalic margin rather evenly convex, broadly but feebly thickened to point of greatest pronotal width, where the angle formed is sharply rounded at slightly more than ninety degrees, latero-caudal margins moderately convex convergent, then concave convergent to the distinct, bluntly rounded, meso-caudal production. Tegmina elongate, width subequal from apex of anal field to a distance equalling the length of that field; rounded apex nearer the costal margin. Wings with numerous, irregular costal veins; ulnar vein with numerous (18) incomplete and few (4) complete branches. Dorsal abdominal segments with latero-caudal angles all blunt and not produced. Supra-anal plate with all but narrow proximal portion subchitinous, about two and one-half times as broad as long; lateral margins feebly convergent, nearly straight to the broadly rounded, nearly rectangulate latero-caudal angles, distal margin transverse, feebly convex. Cerci moderately elongate, tapering moderately to the very slender distal third, joints distinct but very weakly crenate. Subgenital plate with sinistral margin moderately convex to beyond mesal point, dextral margin decidedly concave.<sup>26</sup> Cephalic femora with ventro-cephalic margin armed proximad with a few heavy, well-spaced spines, succeeded by a row of microscopic widely spaced piliform spines, with a single heavy and very elongate distal spine; other ventral femoral margins moderately supplied with heavy spines. Caudal metatarsus very elongate and slender, equal to combined length of succeeding joints, armed along each ventral margin with a closely-set row of minute spines; four proximal tarsal joints each with a round distal pulvillus, the surface of which is produced caudad. Large arolia present.

<sup>26</sup> In this specimen the subgenital plate is apparently distorted. A single microscopic style is apparent in the concavity of the dextral margin.



Type and peculiarities of color pattern very important in present group, but differences due to individual variation must always be discounted.

Length of body, 25.5; pronotum, 6.7; tegmen, 25.9; wing, 23.9; caudal tibia, 8.7; caudal tarsus, 5.8 mm. Width of pronotum, 8.7; tegmen, 7.6; wing, 15 mm.

General coloration ochraceous cinnamon buff, marmorate with tawny olive and spotted with mummy brown. Head with occiput to interocellar band dresden brown, heavily marked with microscopic dots of mummy brown; ocellar areas and a narrow connecting band ventrad, clouded ochraceous-buff, face below this clouded with prout's brown, in other portions clay color. Pronotum clay color sprinkled evenly and heavily with microscopic dots and a few larger flecks of mummy brown. Tegminal ground color cinnamon buff, marbled with tawny olive, each minute marmorate area becoming darker distad, individually dresden brown to mummy brown, with a heavy fleck of mummy brown mesad in the anal field and a number of such irregular markings mesad on the tegmina. Wings hyaline showing a faint buffy tinge, except from area of costal veins to apex where they are translucent, suffused briefly proximad with cinnamon buff, the larger remaining distal suffusion tawny olive, all rather thickly flecked with prout's brown. Body buckthorn brown, the abdomen suffused with prout's brown to mummy brown distad. Limbs clay color, the spines and tarsi prout's brown.

The type is unique.

#### BLATTINAE

#### **LAMPROBLATTA**<sup>27</sup> new genus

This genus is of particular interest, due to the fact that it probably includes the only known American species of the Blattinae lacking tegmina of any kind. Furthermore these are the only species of the Blattinae having the dorsal surface smooth and showing this condition.

The genus includes three species: *meridionalis* (Bruner),<sup>28</sup> *albipalpus* here described, and *zamorensis* (Giglio-Tos).

<sup>27</sup> From λαμπρός = shining.

<sup>28</sup> 1906. *Blatta* (*Stylopiga*) *meridionalis* Bruner, Jour. N. Y. Ent. Soc., xiv, p. 141. [♂, ♀, Trinidad.]

The described pair, an additional female and an immature specimen bearing the same data, have been kindly submitted for examination by Professor Bruner. We here select the adult male, in the Bruner Collection, as single type. In addition there is before us an adult male taken at Montserrat, Trinidad, by A. Busck, July 27, from the National Museum.

Giglio-Tos' *Stylopyga zamorensis*, described from the valley of Zamora, Ecuador, in Boll. Mus. Zool. Anat. Comp. Univ. Torino, xiii, No. 311, p. 10, (1898), also belongs to the present genus. This is a species differing from *albipalpus* in its decidedly greater size and differently colored coxae and limbs.

The nearest relationship is clearly with the genus *Eurycotis*: the most important features of difference being the absence of tegmina; less flattened structure, with dorsal surface consequently more convex, and more elongate and slender tarsal joints, with metatarsi longer than the combined length of the succeeding joints. The greater general body convexity shows agreement with the genus *Pelmatosilpha*.

*Genotype*.—*Lamproblatta albipalpus* new species.

*Description of Genus*.—Form less deplanate than in *Eurycotis*, entire dorsal surface and ventral surface of abdomen rather decidedly convex. Head evenly rounded, eyes widely separated and not projecting; maxillary palpi rather short. Pronotum with surface evenly convex; margin evenly convex, this strongest cephalad, to the transverse caudal margin. Mesonotum and metanotum with surface transversely convex, this less decided on abdomen. Tegmina and wings absent. Supra-anal and subgenital plates in both sexes of the type characteristic in the genus *Eurycotis*. Limbs heavily spined as in that genus. Tarsal joints elongate and slender. Caudal metatarsus longer than combined length of succeeding joints, supplied with a double row of minute ventral spines to its extremity, which border distad the large elongate distal pulvillus. Succeeding three joints with ventral surfaces fully occupied by large pulvilli. Large arolia present.

***Lamproblatta albipalpus*** new species (Plate XVII, figs. 7, 8 and 9.)

This species shows nearest general resemblance to *Eurycotis mexicana* (Saussure), differing signally, however, in its jet black coloration, white palpi and the features given in the generic discussion.

Compared with *meridionalis*, that species is found to differ in both sexes in having the limbs blackish chestnut rather than black, the pale portions more yellowish and not as contrasting, ochraceous-buff, and the supra-anal plate truncate distad, the distal margin showing no emargination and transverse or very feebly convex. The most important differential character, however, is that in *meridionalis* both sexes have similarly simple, elongate, slender metatarsi.

*Type*.—♂; Cincinnati, Sierra Nevada de Santa Marta, Magdalena, Colombia. Elevation, 4000 to 5000 feet. July 14, 1913. M. A. Carriker Jr. [Hebard Collection, Type No. 446.]

Size no larger than the smallest species of *Eurycotis*, form nearly elliptical. Interocular space appreciably broader than the very wide space between the antennal sockets; ocellar spots distinct. Maxillary palpi short; third and fourth joints subequal in length; fifth shorter, little enlarged, ventral margin oblique to point of greatest width, two-thirds distance to base. Pronotum as given in generic description; latero-caudal angles rather sharply rounded rectangulate. Mesonotum with caudal margin almost perfectly transverse, with latero-caudal angles rather sharply rounded rectangulate. Metanotum with caudal margin transverse, very broadly and weakly concave, with latero-caudal angles very feebly produced, very sharply rounded, at less than a right angle. Caudal margins of dorsal abdominal segments very feebly and distantly beaded, latero-caudal angles very feebly acute-angulate produced, this increasing slightly distad to seventh segment. Supra-anal plate feebly tectate with sides concave, lateral margins concave convergent to distal margin, which is about two-thirds as long as the plate, feebly obtuse-angulate emarginate with plate there feebly subchitinous. Cerci stout, margins entire, rounding to acute apex, articulations subobsolete, dorsal and ventral surfaces moderately convex, the latter heavily haired. The two plates beneath the supra-anal plate, which form a heavy triangular adjacent production, are large and conspicuous. Beneath these are the complex concealed genitalia: genital hook elongate and slender, weakly curved dextrad to suddenly incurved and broadened apex. Subgenital plate of the characteristic Blattiniid type; lateral margins moderately convex to styles, distal margin between these feebly convex, transverse. Styles feebly inset, small, cylindrical, similar, half as long as the distance between their bases. Limbs heavy, with armament heavy, as given in generic description. Caudal metatarsus longer than combined length of succeeding joints, decidedly thickened: all metatarsi stout, broadening in proximal third, thence narrowing feebly to apex, the ventral margin broadly convex; ventral surface with a row on each margin of minute spines which in the distal two-thirds border the very large and elongate pulvillus.

*Allotype*.—♀; same data as type. [Hebard Collection.]

Size slightly larger than male, differing in the following features. Supra-anal plate tectate, with sides declivent to near the lateral margins which are slightly raised; lateral margins almost straight, convergent to the decidedly concave distal margin which equals about half the length of the plate. Subgenital plate of the characteristic valvular Blattiniid type, the valves differing from those of *Eurycotis mexicana* in being considerably shorter than the basal portion of the plate, with proximal suture much narrower and less strongly defined. Caudal metatarsus decidedly longer than combined length of succeeding joints, slender: all metatarsi elongate and slender, the ventral margin straight; ventral surface with a row on each margin of minute spines, which at the immediate extremity border the large pulvillus.

*Measurements (in millimeters)*

♂	Length of body	Length of pronotum	Width of pronotum	Greatest width of abdomen	Length of caudal femur	Length of caudal metatarsus
Corozal, Panama . . .	17	5	—	7.8	6	2.7
Empire, Panama . . .	17	5.4	7.3	8	6	—
Gatun, Panama . . .	14	5	7.1	7.8	6	2.7
Gatun, Panama . . .	13.7	4.7	6.7	7.6	5.8	2.6
Cincinnati, Colom- bia, <i>type</i> . . . . .	17	5.5	7.2	8.6	6.7	2.8
♀						
Corozal, Panama . . .	18.5	5.8	7.8	9.2	6.7	2.8
Gatun, Panama . . .	17.5	5.7	7.9	9	6.9	2.8
Gatun, Panama . . .	18.4	5.7	7.7	9	6.9	2.8
Cincinnati, Colom- bia, <i>allotype</i> . . . . .	16.8	5.5	7.3	9.3	6.8	2.7
Cincinnati, Colom- bia, <i>paratype</i> . . . . .	17	5.6	7.4	9.3	7	2.8

General coloration of entire dorsal surface shining, polished, jet black, showing a chestnut tinge only in a strong light. Head the same but with ocellar spots buffy, clypeus suffused zinc orange and palpi strikingly whitish buff. Dorsal surface of limbs jet black, in some specimens showing a chestnut tinge. Other ventral portions deep blackish chestnut, shining, except the coxae in which the latero-external margins and distal portions are pale, ochraceous-buff, in some specimens tinged with zinc orange. In the immature examples from Panama the pronotum, mesonotum, metanotum and limbs are in large part shining chestnut, translucent laterad, giving them a very different general appearance.

The enlarging of the male metatarsi only begins in the last instar before maturity, there showing a slight enlargement with slightly increased size of the distal pulvillus. The preceding instars show in both sexes the type found in the adult female.

This insect was found widely distributed by us in Panama, being the most plentiful roach under litter in or near the jungle. Individuals were not as rapid in their movements as the *Pseudomopid* and *Epilamprid* material there found, as would be expected from their heavier structure.

*Specimens Examined:* 31; 6 males, 8 females and 17 immature individuals.

Gatun, Canal Zone, Panama, VII, 17 to VIII, 22, 1916, (D. E. Harrower), 2 ♂, 2 ♀, 1 large juv. ♀, [Hebard Cln.].

Obispo Station, Canal Zone, Panama, VII, 6 to 11, 1871, (Steindachner), 1 ♂, 1 ♀, [M. C. Z.].

Zone limit five miles west of Empire, Canal Zone, Panama, IX, 14, 1913, (M. Hebard; rubbish under vines on edge of jungle), 1 ♂, 1 ♀, [Hebard Cln.].

Corozal, Canal Zone, Panama, XI, 13 and 17, 1913, (M. Hebard; under decaying banana stem lying in jungle), 1 ♂, 1 ♀, [Hebard Cln.].

Old Panama, Panama, XI, 13, 1913, (M. Hebard; under drift on edge of coral sand beach), 1 small juv. ♀, [Hebard Cln.].

Taboga Island, Panama, II, 23, 1912, (A. Busck), 1 large juv. ♂, [U. S. N. M.].

Tabogilla Island, Panama, II, 16, 1912, (A. Busck), 1 large juv. ♂, 1 medium juv. ♂, 2 large juv. ♀, [U. S. N. M.].

Cincinnati, Sierra Nevada de Santa Marta, Magdalena, Colombia, 4000 to 5000 feet, VII, 10 and 14, 1914, (M. A. Carriker Jr.), 1 ♂, 2 ♀, *type*, *allotype*, *paratype*, 1 very large juv. ♂, [Hebard Cln.].

Venezuela, 1 ♀, [A. N. S. P.].

### *A Note on Eurycotis and Pelmatosilpha*

The genera *Eurycotis* and *Pelmatosilpha* have been dogmatically separated by features of tegminal length; species with abruptly truncate or lateral tegmina being referred to *Eurycotis*, those with less decidedly reduced or fully developed tegmina to *Pelmatosilpha*.

From study of the considerable series at hand, representing numerous species of both genera, we would distinguish between them as follows:

A. Dorsal surface of insect less convex. Tegmina transversely truncate, or more decidedly reduced, lateral. (The dark species have dorsal surface and tegmina roughened. Many species of pale coloration represented with differently striking color patterns.)..... ***Eurycotis* Stål**

AA. Dorsal surface of insect more convex. Tegmina truncate but obliquely so, with distal angle at sutural margin the more produced, or fully developed. (All are dark species with dorsal surface including tegmina polished and frequently showing a purplish sheen. Some of the species have pronotum and tegmina conspicuously margined with yellow.)..... ***Pelmatosilpha* Dohrn**

It is evident from the description that *Eurycotis cothurnata* Giglio-Tos must be assigned to *Pelmatosilpha*, as is possibly true for *Eurycotis subalata* Saussure and Zehntner, the description of the tegmina of the latter species leaving considerable doubt as to their actual form. From material at hand from Trinidad we are also able to assign *Pelmatosilpha decipiens* Kirby to *Eurycotis*. That author has badly confused these genera and their established synonymy.<sup>29</sup>

***Pelmatosilpha micra*** new species (Plate XVIII, fig. 2.)

The present species is evidently closely related to *P. villana* Saussure and Zehntner and *P. cothurnata* (Giglio-Tos). It differs from both in the smaller size, particularly indicated by the

<sup>29</sup> Synon. Cat. Orth., i, pp. 142 to 144, (1904). See Hebard, Mem. Am. Ent. Soc., No. 2, pp. 165 and 166, (1917).

pronotum.<sup>30</sup> Compared further with *villana*, we find that species to differ in the black palpi, tegmina distinctly longer than broad, blackish chestnut limbs and cerci which are reddish distad only.

The differences shown by *cothurnata* are: the black head, yellow antennae, slightly more abbreviate tegmina, minute lobi-form wings, black limbs with tibiae ferruginous and yellow cerci.

It is possible that *Eurycotis subalata* Saussure and Zehntner may be still another closely allied species of *Pelmatosilpha*. In that insect the tegmina are considerably shorter than in *micra* and other features of differences are indicated in the brief and unsatisfactory original description.

*Type*.—♂; La Palmeta, Santander, Colombia. Elevation, 7500 feet. July 15 to 20, 1916. (M. A. Carriker, Jr.) [Hebard Collection, Type No. 465.]

Size small for the genus, form robust. Head broad; very broad interocular space very slightly greater than that between antennal sockets; ocelli represented by minute spots. Pronotum smooth and polished, broad, rather decidedly convex, particularly laterad; cephalic and lateral margins very feebly cingulate, lateral margins divergent and weakly convex to the rounded rectangulate latero-caudal angles, caudal margin transverse, very feebly convex. Tegmina overlapping, extending mesad to base of second dorsal abdominal segment, polished with subobsolete punctae; venation obsolete, anal sulcus briefly indicated only near extremity of sutural margin; costal margins feebly cingulate, subparallel, feebly convex to the broadly convex obtuse-angulate costal angle, the distal margin continuing this curvature and moderately oblique to the rounded, weakly obtuse-angulate, more produced sutural angle, sutural margin weakly convex. Wings atrophied, extending mesad to median portion of first dorsal abdominal segment, fields distinct, anterior field the wider and rather strongly chitinous toward the costal margin, veins coarse and irregular.<sup>31</sup> Disto-lateral angles of fourth to sixth dorsal abdominal segments sharply but briefly acute-angulate produced in increasing ratio caudad. Supra-anal plate rounded trapeziform<sup>32</sup> with distal portion decidedly hairy. Cerci depressed, rigid, with lateral margins entire but joints distinct, three times as long as greatest width, apex acute. Internal genitalia complex. Subgenital plate of normal type for genus, styles well inset, cylindrical, feebly incurved, about five times as long as basal width. Armament of limbs heavy, as characteristic of genus. Caudal metatarsus

<sup>30</sup> The measurements for the others are both apparently for the female sex, and, in consequence, the size difference for *micra* is probably not as considerable as comparison of the measurements given in the original descriptions of these species would indicate.

<sup>31</sup> Very similar to those of *P. villana* as given in the original description of that species.

<sup>32</sup> Somewhat deformed dextro-distad in this specimen.

broadening distad, slightly longer than combined length of succeeding three joints, ventral margin with a double row of minute spines in proximal two-thirds, distal third occupied by a large pulvillus, succeeding three joints with ventral surfaces fully occupied by large pulvilli. Arolia well developed.

Length of body, 18; pronotum, 5.8; tegmen at costal margin, 5.1; tegmen at sutural margin, 6.2; exposed portion of tegmen at sutural margin, 5.8; cercus, 1.9; style, 1; caudal femur, 6.9 and caudal metatarsus, 2.2. Width of interocular space, 3; pronotum, 7.9; dextral tegmen, 5.7; sinistral tegmen, 5.6 and abdomen, 9.9 mm.

General coloration shining blackish brown. Head with occiput chestnut, the sulci slightly darker, eyes and face blackish chestnut, minute ocellar spots ochraceous-tawny, mouthparts and palpi russet. Antennae russet shading to cinnamon brown distad. Tegmina shining blackish brown, opaque, when held up to light chestnut, a metallic purplish sheen is present on the dextral tegmen immediately before the narrow sutural marginal portion which is concealed when at rest and which is transparent, tinged with brown. Wings transparent, tinged with brown, this stronger toward the costal margin, there burnt sienna. Mesonotum and metanotum weak ochraceous-orange. Abdomen shining blackish brown, cerci carob brown. Coxae ochraceous-tawny tinged with dark brown meso-proximad. Cephalic and median limbs and caudal femora russet, caudal tibiae briefly russet proximad, shading rapidly to blackish chestnut brown, caudal tarsi blackish chestnut brown.

In addition to the type, a single immature specimen in one of the later instars, bearing the same data, is at hand.

***Periplaneta brunnea* Burmeister.**

1838. [*Periplaneta*] *brunnea* Burmeister, Handb. Ent., ii, abth. ii, part i, p. 503. [♂, ♀: Chile; Demerara [=British Guiana].]

Ambalema, Tolima, 900 feet, IX, 1914, (from A. Maria), 1 ♂, [Hebard Cln.].

***Periplaneta australasiae* (Fabricius)**

1775. [*Blatta*] *australasiae* Fabricius, Syst. Ent., p. 271. ["In nave e mare pacifico et regionibus incognitis revertente."]

Pacho, Cundinamarca, III, 19, 1917, (from A. Maria), 12 ♂, 4 ♀, 1 juv. ♀, [Hebard Cln.].

Fusugasugá, Cundinamarca, 5464 feet, XII, 1916, (from A. Maria), 1 ♂, 1 ♀, [Hebard Cln.].

PANCHLORINAE

***Leucophaea maderae* (Fabricius)**

1781. [*Blatta*] *maderae* Fabricius, Spec. Ins., i, p. 341. [Madeira.]

Fusugasugá, Cundinamarca, 5464 feet, XII, 1916, (from A. Maria), 1 ♂, 1 ♀, [Hebard Cln.].

***Pycnoscelus surinamensis*** (Linnaeus)

1767. [*Blatta*] *surinamensis* Linnaeus, Syst. Nat., ed. xii, p. 687. [Surinam.]

Jimenez, Cauca, 1600 feet, VII, 1907, (M. G. Palmer), 3 ♀, [A. N. S. P.].

***Panchlora cubensis*** Saussure

1862. *P[anchlora] cubensis* Saussure, Rev. et Mag. de Zool., 2e sér., xiv, p. 230. [♀, Cuba.]

Caldas, Cauca, 2560 feet, V, 14, 1914, (H. S. Parish), 1 ♀, [A. N. S. P.].

This specimen agrees fully with Cuban females of the species before us.<sup>33</sup> In it the eyes are very narrowly separated by a distance about one-fifth the greatest ocular width; this feature apparently varies in the present species. In fact so much variation is seen to occur in the large series at hand of *cubensis*, that the species is clearly one of the centers of difficulty in the proper understanding of the genus.<sup>34</sup>

The measurements of the specimen recorded are: length of body, 19.4; pronotum, 5.7; tegmen, 20.7 mm. Width of pronotum, 6.4; tegmen, 6.3 mm.

***Panchlora colombiae*** new species (Plate XVIII, fig. 3.)

This plain green species is closely related to *P. bidentula* Hebard, known only from the male sex, this sex of the present species differing in the larger size, normally wider interocular space and striking genitalic features.

Compared with both sexes of *P. cubensis* Saussure, the present insect is found to differ in the normally wider interocular space, proportionately larger pronotum, proportionately wider tegmina and distinctive male genitalic features.<sup>35</sup>

From the insufficient description of *P. punctum* Saussure and Zehntner, based on a single female from "Central America," a possibility of the present material representing that species might exist, were it not for the fact that Central American material of

<sup>33</sup> See diagnosis: Hebard, Mem. Am. Ent. Soc., No. 2; pp. 197 to 199, pl. viii, figs. 2 to 5, (1917).

<sup>34</sup> See Hebard, Ent. News, xxvii, pp. 217 to 222, (1916).

<sup>35</sup> We would note, however, that unless a large collection representing many species of the plain green species of *Panchlora* is available, the student is certain to have almost insurmountable difficulties in determining single females belonging to this section of the genus.



the present species before us is even smaller than the material here treated, with interocular space narrower.<sup>35</sup>

*Type*.—♂; La Cumbre, Cordillera Occidental, Cauca, Colombia. Elevation, 6600 feet. May 15, 1914. (H. S. Parish.) [Academy of Natural Sciences of Philadelphia, Type No. 5346.]

Size medium large, form moderately broad, when compared with the species of nearest affinity. Head with eyes very broad in front; eyes separated by a brief space, in width about one-sixth the greatest diameter of the eye.<sup>37</sup> Pronotum and tegmina of normal form, the clear margins of these parts somewhat tessellate with greenish and in consequence somewhat opaque. Supra-anal plate rounded subrectangular, transverse distad but produced beyond apex of produced subgenital plate, dorsal surface weakly concave; lateral margins straight and longitudinal to broadly rounded disto-lateral angles, this convexity continued on the caudal margin, thus forming a moderate obtuse-angulate emargination mesad. Cerci small, more elongate than in *bidentula* but of similar form, extending well beyond supra-anal plate, tapering gently and evenly to flattened, narrow and rather sharply rounded apex. Subgenital plate transverse, roughly triangularly bilobate produced, the sinistral produced portion broadest, reaching from base of sinistral style to mesal point, the dextral production adjacent, brief, the area of these productions bent dorsad. Very slender, straight, cylindrical styles are situated on the free margin of the subgenital plate at the inner margins of the cercal bases; the sinistral extending beyond distal margin of supra-anal plate to base of slender apical portion of cercus, two-thirds as long as cercus; the dextral very slightly shorter. Femora with normal hairs and spines extremely delicate.

*Allotype*.—♀; same data as type, but taken May 18, 1914. [Academy of Natural Sciences of Philadelphia.]

Size larger than male, form proportionately broader. Head with interocular space broader, three-fifths as wide as greatest ocellar width; the eyes, however, decidedly narrower than in male. Pronotum ample, proportionately distinctly larger than in females of *cubensis*. Tegmina elongate and broad, proportionately broader than in females of *cubensis*. Genitalia showing no differences from *cubensis*, of the characteristic type found in the plain green species of the genus.

*Measurements (in millimeters)*

♂	Length of body	Length of pronotum	Width of pronotum	Length of tegmen	Width of tegmen
La Cumbre, Colombia, <i>type</i> . . . . .	15.3	4.2	5.1	16.8	5.6
La Cumbre, Colombia, <i>paratype</i> . . . . .	16.7	4.5	5.6	17.4	5.9

<sup>36</sup> The female type of *punctum* is described as having ample pronotum and much wider interocular space than the females of *colombiae*.

<sup>37</sup> In the recorded series of *P. bidentula*, one male from Caparo, Trinidad, has the interocular space fully as wide.

♀	Length of body	Length of pronotum	Width of pronotum	Length of tegmen	Width of tegmen
La Cumbre, Colombia, <i>allotype</i> . . . . .	22.7	5.7	7.7	22.6	7.8
La Cumbre, Colombia, <i>paratype</i> . . . . .	22.2	6	7.4	22.7	8.3
Cauca, Colombia . . . . .	19.8	5.4	6.8	20.9	7.3
Cauca, Colombia . . . . .	18.8	5.9	7.7	21.2	7.7

The pronotal differences, though apparent, are not as decided as the measurements would indicate, this portion being more flattened in some specimens than in others, while the caudal production is sometimes curved downward, sometimes flat.

The subgenital plate of the male paratype is deformed, this particularly affecting the area of the dextral production.

The entire series is apparently slightly faded. The general coloration is shining, light green yellow. Lateral margins of pronotum and lateral fields of tegmina opaque, greenish. Lateral cream colored lines of pronotum and tegmen conspicuous, the disk of the pronotum tinged with reddish in one female from Cauca, Colombia. Eyes very dark brown, the interocular space ferruginous to varying degrees. Antennae antimony yellow, immaculate. From one to two inconspicuous blackish brown dots are present on the tegmina in their distal half in all except two females.

*Specimens Examined:* 6; 2 males and 4 females.

La Cumbre, Cordillera Occidental, Cauca, Colombia, 6600 feet, V, 15 and 18, 1914, (H. S. Parish), 2 ♂, 2 ♀, *type, allotype, paratypes*, [A. N. S. P.].

Cauca, Colombia, 2 ♀, [A. N. S. P.].

### **Zetobora lata** Shelford

1907. *Zetobora lata* Shelford, Ann. Mag. Nat. Hist., (7), xix, p. 45. [♂, no locality given.]

Bogotá, Cundinamarca, 8750 feet, (H. G. Klages,) 1 ♀, [U. S. N. M.].

This specimen agrees fully with the type except in being appreciably smaller. The subgenital plate is distinctly bilobate-produced meso-distad, though not as strongly so as the supra-anal plate. The femora entirely lack genicular spines and have their ventral margins unarmed; the ventro-cephalic margin of the cephalic femora is supplied distad with a row of well separated, moderately elongate hairs, as are the ventro-caudal margins of the median and caudal femora throughout their length.

Length of body, 25; pronotum, 8; tegmen, 20.2. Width of pronotum, 12.9; tegmen, 10 mm.

#### BLABERINAE

##### **Blaberus giganteus** (Linnaeus)

1758. [*Blatta*] *gigantea* Linnaeus, Syst. Nat., ed. x, i, p. 424. [America.]

Cincinnati, Sierra Nevada de Santa Marta, Magdalena, VII, 10, 1913, (M. A. Carriker Jr.; fundacion), 5 ♀, 1 juv. ♂,<sup>38</sup> [Hebard Cln.].

This insect differs from *B. colosseus* (Illiger) only in the average proportionately broader pronotum and wider marginal field of the tegmina. It is possible that that name may be found invalid, representing a mere variation of the present species. Much larger series of both conditions must be had before this can be finally settled.

##### **Blaberus colosseus** (Illiger)

1802. *Blatta colosseus* Illiger, Mag. Insektenkunde, i, p. 186. [Demerara [= British Guiana].]

Muzo, Boyaca, 2700 feet, VI, 1915, (from A. Maria), 1 ♂, [Hebard Cln.].

The measurements of this specimen are: length of body, 59; pronotum, 15.8; tegmen, 66.7. Width of pronotum, 21.6; tegmen, 22; marginal field of tegmen, 6.8 mm. Length contained in width of pronotum 1.37 times.

##### **Blaberus discoidalis** Serville

1839. *Blabera discoidalis* Serville, Hist. Nat. Ins., Orth., p. 76. [♀, Santo Domingo.]

Cincinnati, Sierra Nevada de Santa Marta, Magdalena, 4000 to 5000 feet, VII, 1913, (M. A. Carriker Jr.), 2 ♂, [Hebard Cln.].

Susumuco, Cundinamarca, 2600 feet, XI, 25, 1916, (from A. Maria), 5 ♂, [Hebard Cln.].

Fusugasugá, Cundinamarca, 5464 feet, XII, 1916, (from A. Maria), 3 ♀, [Hebard Cln.].

The Cincinnati specimens are exceptionally large for the species, representing the optimum condition, and are similar to material recently recorded adventive in the United States from Colombia.<sup>39</sup> The remainder of the series is typical, the pronotal spot showing considerable variation, as is usual, in extent and contour.

<sup>38</sup> This series has been fully discussed; Ent. News, xxvii, p. 290, (1916).

<sup>39</sup> Mem. Am. Ent. Soc., No. 2, p. 273, (1917).

## OXYHALOINAE

**Chorisoneura translucida** (Saussure)

1864. *Bl[atta] translucida* Saussure, Rev. et Mag. de Zool., (2), xvi, p. 311. [[♀], Mexico.]

La Cumbre, Cordillera Occidental, Cauca, 6600 feet, V, 14, 1914, (H. S. Parish), 1 ♀, [A. N. S. P.].

A considerable series of apparently the same species from Mexico, Guatemala, Costa Rica and Panama is before us. More material is, however, needed before we can state definitely whether the somewhat marked differences observed are attributable in all cases to individual variation, or should be in some used as a basis for geographic racial or even specific separation.

We would note that subsequent records, from various portions of South America, of the species originally described from Mexico, are in the majority of cases found to represent actually distinct species. The species which have so wide a range are almost all ubiquitous and abundant forms. To this category the present species may belong.

The species is apparently closely allied to *C. mysteca* Saussure.<sup>40</sup> From the original description that insect apparently differed only in the tegmina having a fuscous humeral line, but later, when more fully described,<sup>41</sup> found to differ also in having the tegmina with veins of the "marginal" (scapular) field very numerous and intercalated.

The specimen before us agrees fully with two females in the Hebard Collection from San Rafael, Vera Cruz, Mexico.

## PERISPHAERINAE

The Perisphaerinae are divided into a number of distinct divisions. First we would place *Dasyposoma* and its allies, showing a strong Blattinid development; then *Stenopilema* and allied genera which show a distinctive type. This type may be said to exhibit an Epilamprine or Panchlorine facies, the general structure showing the Epilamprine tendency the stronger. In this group the three new American genera described below should be placed first; *Colapteroblatta* indeed showing closest general similarity to certain aberrant genera of the Epilamprinae, differing very widely from these in features which assign it to the Perisphaerinae. The groups which come after are: that including

<sup>40</sup> Rev. et Mag. de Zool., (2), xiv, p. 167, (1862).

<sup>41</sup> Mém. l'Hist. Nat. Mex., iv, Blatt., p. 110, (1864).

*Hormetica* and allied genera, showing a Blaberine facies, and lastly that in which belongs *Paranauphoeta*, showing striking approach toward the Panesthinae.

Still other divisions are represented in the present subfamily, but at present insufficient material is before us to assign these properly.

**COLAPTEROBLATTA**<sup>42</sup> new genus

The simple type of pronotum in the present genus is remarkable in the present group, the majority of the forms of which have the lateral wings of the pronotum deflexed and variously specialized.<sup>43</sup>

Nearest relationship is found in *Poroblatta*, also an American genus, described on page 123, where these genera are compared.

*Genotype*.—*Colapteroblatta compsa* new species.

*Description of Genus*.—Form dissimilar in the sexes: male elongate, rather broad, with dorsal surface of abdomen feebly convex between the moderately raised lateral margins; female less elongate, broad, with dorsal surface of abdomen evenly convex. Head of male with interocular space broad and ocelli large and sharply defined, of female with interocular space extremely broad and ocelli small but distinct. Pronotum of male moderately punctulate, with surface very weakly convex except above the head, where the convexity is more decided, and laterad where the lateral wings are subdeplanate and feebly declivent, caudal margin feebly convex with a median angulation subobsolete; of female moderately punctulate, with surface moderately convex, the greatest convexity above the head (less than in male) and declivent, unspecialized lateral wings (more strongly declivent than in male), leaving the evenness of the general convexity little disturbed. Tegmina of male delicate, very elongate and narrow, extending much beyond apex of abdomen; of female heavily chitinous, abbreviate. Wings of male fully developed; of female minute, atrophied pads. Supra-anal plate of male bilobate, very delicate; of female with distal margin convex but showing traces of bilobation, heavily chitinous. Subgenital plate of male of characteristic Blaberine type (variously developed also in the Epilamprinae and Panchlorinae); of female simple, ample, convex and fitting closely all of ventral portion of abdomen beyond fifth

<sup>42</sup> From *κολαπτήρ* = chisel.

<sup>43</sup> See Shelford, *Ann. Mag. Nat. Hist.*, (8), i, p. 162, (1908).

dorsal abdominal segment. Limbs moderately heavy in male, heavier in female; in both sexes with cephalic femur very slightly wider proximad than distad, the ventro-cephalic margin supplied with a fringe of hairs, terminating distad in a single heavy, reduced spine, ventro-caudal margin with one or several similar distal spines; ventro-cephalic margins of median and caudal femora with very few, irregularly scattered, distant, reduced spines, ventro-caudal margins of median and caudal femora with more numerous, heavier but reduced spines. Tarsi similar in both sexes except that the joints are more slender in the male; caudal metatarsus no longer than combined length of first three succeeding joints; four proximal joints with ventral surfaces unarmed and fully occupied by large pulvilli, which are bluntly angulato-produced distad, that of metatarsus linear in proximal portion. Large arolia present between the delicate tarsal claws.

***Colapteroblatta compsa*** new species (Plate XIX, figs. 1 and 2.)

The males are unknown of the species showing nearest affinity to this large and striking insect. When compared with the female of that species, *Poroblatta cylindrica*, here described, that sex of the present insect is found to differ in the much broader form, weak hooding of the pronotum cephalad even less apparent but with lateral wings likewise simple, overlapping sutural margins of the tegmina and less reduced cerci, which in normal position extend slightly beyond the curvature formed by the free margin of the adjacent segments.

*Type*.—♂; San Lorenzo, Sierra Nevada de Santa Marta, Magdalena, Colombia. Elevation, 7000 to 8300 feet. August 23, 1913. (M. A. Carriker Jr.) [Hebard Collection, Type No. 447.]

Size large for group; form elongate, rather broad. Head with interocular area deplanate, moderately punctulate, forming a weak, rounded, obtuse-angulation with the deplanate, moderately punctulate face; eyes large, moderately projecting; interocular space broad, as wide as eye, slightly broader than interocellar space, considerably narrower than width between antennal sockets; ocelli decided, large, flattened surfaces oblique to plane of intervening area. Maxillary palpi small and slender; third joint longest; fourth decidedly shorter; fifth (distal) joint intermediate in length between these, weakly enlarged. Pronotum, tegmina, wings, abdomen and limbs as given in generic description. Oblique sulci of pronotal disk broad, distinct. Tegmina broadest meso-distad, with discoidal sectors moderately oblique. Sinistral wing with few (3) complete and many (16) incomplete rami of the ulnar vein; inter-

calated triangle very elongate and narrow. Cerci small, elongate, extending caudad beyond distal margin of supra-anal plate, tapering evenly to the sharply rounded apex, with lateral margins distinctly crenate. Subgenital plate with surface weakly convex; minute, subchitinous, slender styles situated on distal margin just inside cerci, the dextral slightly the longer; distal produced portion of plate between these with sinistral margin moderately convex to beyond mesal point, rounding there into the straight, oblique dextral margin.

*Allotype*.—♀; same data as type. [Hebard Collection.]

Body bulk larger than male; form elongate elliptical, broad. Head much more simple than in male, front portion entirely deplanate, moderately punctulate; eyes reduced, not projecting; interocular space very broad, as wide as space between antennal sockets; ocelli reduced, small, smoothly concave, irregularly rounded. Maxillary palpi slightly heavier than in male. Pronotum, tegmina, wings, abdomen and limbs as given in generic description. Pronotal surface more evenly convex than in male with oblique sulci of disk obsolete, latero-caudal angles rectangulate, sharply rounded, caudal margin perfectly transverse. Tegmina truncate, about as long as wide, roundly produced caudad at costal margin, thence with distal margin roundly emarginate, this cutting through the distal portion of the anal field, angle at sutural margin slightly less than ninety degrees, with apex sharply rounded. Cerci greatly reduced, very small, short; brief lateral margins entire, apex acute.

*Measurements (in millimeters)*

	♂	Length of body	Length of pronotum	Width of pronotum	Length of tegmen	Width of tegmen <sup>44</sup>	Width of abdomen
San Lorenzo, <i>type</i> . . . . .		27.7	6.2	8.9	33.9	9.8	9.4
	♀						
San Lorenzo, <i>allotype</i> . . . . .		28.5	7.2	9.7	6	7.9	12.2
San Lorenzo, <i>paratype</i> . . . . .		25.7	7	9	5.3	6.3	11
San Miguel, <i>paratype</i> . . . . .		28.8	7.3	9.4	5.8	6.8	12.3
San Miguel, <i>paratype</i> . . . . .		26.1	6.3	8.7	6.7	6.7	10.8

The degree and curvature of the tegminal truncation in females shows some variation in the series before us.

*Coloration*. ♂. *Type*.—Pronotum with mesal portion shining black tinged with chestnut and shading to chestnut meso-caudad, laterad this marking is angulate produced before the mesal point, thence the lateral margins are nearly straight, moderately divergent to caudal margin above humeral trunk of tegmina; lateral wings transparent warm buff, this extending rather broadly across the pronotum along the cephalic margin, there suffused caudad; punctae in the pale area chestnut brown. Tegmina transparent, marginal field warm buff, the numerous irregular veinlets more strongly so, humeral trunk bay, other proximal portions washed with chestnut, this fading gradually to apex of anal field and with flecks of chestnut, thence the tegmina are buffy, this weakest in distal portions. Wings almost colorless, showing a faint buffy tinge toward the margins of the anterior field, with an irregular line of opaque

<sup>44</sup> This is for the exposed portion only.

light buff distad along the mediastine vein. Dorsal surface of abdomen raw umber, with lateral margins rather broadly warm buff. Head with face shining blackish with a chestnut tinge, becoming slightly paler on occiput, eyes prout's brown, ocelli light buff, antennae uniform cinnamon brown, genae, mouthparts and limbs brussels brown. Ventral surface of abdomen shining black, shading to brussels brown meso-proximad, rather broadly margined with warm buff, this continued as a narrow marginal line on the subgenital plate.

♀. *Allotype*.—Pronotum with mesal portion shining black shading to deep carob brown meso-caudad, lateral margins of this marking not showing the angulate production before the mesal point as strongly as in the male and feebly convex divergent caudad; lateral wings antimony yellow, punctae and cingulate margin bay. Tegmina with anal field carob brown, marginal field antimony yellow, punctae and larger distal flecks bay, intervening portion between these areas blackish tinged with carob brown. Wings minute, vestigial, irregular pads. Abdomen entirely shining black, showing a very faint carob brown tinge. Head with face the same color, shading to carob brown on occiput, ocelli and mouthparts clay color. Coxae deep bay black, other portions of limbs and antennae deep bay.

In the majority of the females before us, the angulate production of the dark pronotal marking is not as decided as in the male. Several are not as dark as the allotype, one individual being much paler, with dark portions of pronotum and tegmina bay and dorsal surface of abdomen heavily tessellate with buffy.

*Specimens Examined*: 11; 1 male, 7 females and 3 immature individuals.

San Lorenzo, Sierra Nevada de Santa Marta, Magdalena, Colombia, 7000 to 8300 feet, VIII, 23, 1913, (M. A. Carriker Jr.), 1 ♂, 2 ♀, *type, allotype, paratype*, 2 juv. in different instars, [Hebard Cln.].

San Miguel, Sierra Nevada de Santa Marta, Magdalena, Colombia, 5500 feet, IV, 24, 1914, (M. A. Carriker Jr.; in bromeliads), 5 ♀, *paratypes*, 1 large juv., [Hebard Cln.].

#### **POROBLATTA**<sup>45</sup> new genus

The present genus is known only from the female, which agrees with that sex in the genus *Colapteroblatta* in the type of head, pronotum with simple lateral wings, abdomen and limbs and their armament. It differs in the more slender form, greater pronotal convexity, and more slender and more strongly convex abdomen.

Closer affinity is shown to the female sex in *Acroporoblatta*, which has, however, a proportionately much larger head, more strongly hooded pronotum with lateral, longitudinal gland-like swelling and lacks tegmina.

*Genotype*.—*Poroblatta cylindrica* new species.

<sup>45</sup> From *πόρος* = boring.



*Description of Genus.*<sup>46</sup>—Form elongate, with entire dorsal surface evenly and strongly convex. Interocular space extremely broad and ocelli small but distinct. Pronotum moderately punctulate with surface strongly convex, the cephalic portion divided from the larger caudal portion by a weak and broad transverse sulcation, distinct only meso-laterad, lateral wings unspecialized. Tegmina heavily chitinous, abbreviate. Distal portion of abdomen, limbs and their armament, pulvilli and arolia as given here in the description of the genus *Colapteroblatta*.

***Poroblatta apatela*** new species (Plate XIX, fig. 3.)

The present species is readily distinguished from the closely allied *P. cylindrica*, described in the present paper, by the slightly more punctate pronotum, with lateral margins of dark area more broadly and less deeply invading mesad the pale lateral portions, tegmina nearly attinent mesad and of the form found in *Colapteroblatta compsa*, here described, and dorsal surface of abdomen strongly mottled laterad. In other respects *apatela* and *cylindrica* agree closely.

*Type.*—♀; La Palmeta, Santander, Colombia. Elevation, 7500 feet. July 15 to 20, 1916. (M. A. Carriker Jr.) [Hebard Collection, Type No. 466.]

Size medium large for the group, rounded cephalad and caudad. Head as described for *cylindrica*. Maxillary palpi with fifth joint decidedly longer than fourth, slightly longer than third. Pronotum as in *cylindrica*, but caudal margin without trace of minute angulate mesal projection. Tegmina<sup>47</sup> truncate, about as long as wide, roundly produced caudad at costal margin, thence with distal margin roundly emarginate, this cutting through the distal portion of the anal field, angle at sutural margin slightly less than rectangulate with apex sharply rounded. Wings vestigial, small rounded pads. Abdomen as in *cylindrica*. Distal portion of abdomen, cerci, limbs and their armament, pulvilli and arolia as given in the generic description of *Colapteroblatta*.

Length of body, 26; pronotum, 6.7; tegmen at costal margin, 5.3; exposed portion of tegmen at costal margin, 4.4; tegmen at sutural margin, 2.3; caudal tibia, 5.3. Width of head, 4.5; pronotum, 7.7; tegmen, 5.2; interval mesad between tegmina, 1.6; abdomen at widest point, 9 mm.

Dorsal surface shining blackish chestnut brown. Pronotum with dorsal portion shining blackish chestnut brown, this invading the cinnamon buff lateral wings briefly in all but a short cephalic and caudal portion, its margin there broadly and weakly convex, punctae and cingulate margin of lateral wings bay. Tegmina shining blackish chestnut brown; marginal field cinna-

<sup>46</sup> Based on female, the male sex being unknown and probably very dissimilar.

<sup>47</sup> In this specimen the distal portion of the dextral tegmen is malformed.

mon buff, the few punctae bay. Head blackish chestnut brown, antennae prout's brown except in proximal portion which is buffy, ocelli, genae, palpi and mouthparts light ochraceous-buff. Coxae and limbs light ochraceous-buff, the spines tawny. Dorsal surface of abdomen shining blackish chestnut brown, the first to sixth segments ochraceous-buff heavily speckled with blackish chestnut brown on each side, these pale portions extending over each segment slightly over one-fourth its width and each showing an oblique bar of blackish chestnut brown running from the outer margin proximad to its median portion, and continued on the succeeding segment mesad as a meso-proximal oblique dash. First and second ventral abdominal segments ochraceous-buff tinged with ochraceous-tawny, and with meso-lateral dots of chestnut on each segment; third segment similar but washed with chestnut proximo-mesad; fourth ochraceous-buff laterad, entirely chestnut mesad becoming blackish proximo-laterad; subgenital plate shining blackish tinged with chestnut, with a large, roughly triangular area of ochraceous-buff proximo-laterad on each side.

The type is unique.

**Poroblatta cylindrica** new species (Plate XIX, fig. 4.)

This species in general form agrees closely with *P. apatela* here described, under which species a comparison is made.

*Type*.—♀; Cincinnati, Sierra Nevada de Santa Marta, Magdalena, Colombia. Elevation, 4000 to 5000 feet. July 10, 1913. (M. A. Carriker Jr.) [Hebard Collection, Type No. 448.]

Size medium large for group; form elongate, rounded cephalad and caudad. Head with front portion deplanate, thickly and irregularly punctulate; eyes reduced, not projecting; interocular space broad, as wide as space between antennal sockets; ocelli small, smoothly concave, irregular in outline. Maxillary palpi small and rather slender, with third and fifth joints subequal in length, the latter weakly enlarged, fourth slightly shorter. Pronotum as given in generic description; latero-caudal angles weakly produced, appreciably less than ninety degrees, sharply rounded; caudal margin almost transverse, lateral halves very feebly concave, showing a minute angulate production at their juncture mesad. Tegmina subtriangular lateral pads; heavily chitinous; surface shining and rather thickly punctulate as is the entire dorsal surface, humeral trunk alone indicated; costal margins almost straight to the bluntly rounded apex, sutural margins very briefly straight oblique-convergent proximad, thence straight oblique divergent to the tegminal apices. Wings minute, vestigial. Abdomen strikingly narrower and more strongly convex than in *Colapteroblatta compsa*, much as in *Acroporoblatta adenophora*. Distal portion of abdomen, cerci, limbs and their armament, pulvilli and arolia as given in the generic description of *Colapteroblatta*.

Length of body, 25.3; pronotum, 6.7; exposed portion of tegmen, 4.8; caudal tibia, 5.6. Width of head, 4.4; pronotum, 7.9; tegmen, 3.9; abdomen at widest point, 9.2 mm.

Dorsal surface shining, black tinged with chestnut brown, this strongest proximad on abdomen. Pronotum with lateral wings almost entirely cinnamon-buff, the punctae and cingulate margin bay, before the mesal point is a triangular invasion of the black mesal portion, which dark portion is also extended to the caudal margin above the humeral trunk of the tegmina. Tegmina black tinged with chestnut brown; marginal field, which includes the apex, cinnamon-buff, the punctae bay. Head black with a feeble chestnut tinge, antennae prout's brown except in proximal portion which is buffy, ocelli, genae, palpi and mouthparts ochraceous-buff. Limbs and coxae pale ochraceous-tawny, the spines slightly darker, coxae suffused proximad on cephalic faces with blackish. Meso-proximal portion of abdomen ochraceous-tawny, becoming black tinged with chestnut laterad and very extensively distad.

The type is unique.

**ACROPOROBLATTA**<sup>48</sup> new genus

The three genera of Perisphaerids here described are all evidently boring types, the females for the most part probably living in and boring through decaying vegetable matter.

The peculiar longitudinal gland-like swelling of the lateral wings of the pronotum in the present genus, is a feature not found in any other American genus of the Blattidae. The pronotal contour shows a more specialized development of the type found in the female sex of *Poroblatta*.<sup>49</sup>

*Genotype*.—*Acroporoblatta adenophora* new species.

*Description of Genus*.—Form elongate with entire dorsal surface strongly convex. Interocular space extremely broad, ocelli small but apparent. Pronotum heavily punctulate, with surface strongly convex, the cephalic portion conspicuously separated from the larger caudal portion by a broad transverse sulcation, strongly defined only meso-laterad; lateral wings with a well-developed, longitudinal, gland-like swelling, lying parallel to the free margin from a point adjacent to the eye to near the caudal margin, the resultant convexity there of the pronotal surface about equally decided on its external and internal surfaces. Tegmina and wings absent. Distal portion of abdomen, limbs and their armament, pulvilli and arolia as given here in the generic description of *Colapteroblatta*.

<sup>48</sup> From ἀκροπόρος = boring through.

<sup>49</sup> It is probable that in these species the males will be found to show similar but less decided pronotal modification than the females.

**Acroporoblatta adenophora**<sup>50</sup> new species (Plate XIX, figs. 5 and 6.)

This species bears *Poroblatta cylindrica*, here described, a strong general superficial resemblance. The major features of difference are pointed out under the discussion of that genus.

*Type*.—♀; Cincinnati, Sierra Nevada de Santa Marta, Magdalena, Colombia. Elevation, 4000 to 5000 feet. July 10, 1913. (M. A. Carriker Jr.) [Hebard Collection, Type No. 449.]

Size medium large for the group; form elongate, rounded cephalad and caudad. Entire dorsal surface thickly but minutely punctulate, except laterad on the pronotum, where the punctae are larger. Head proportionately larger and much broader than in *Poroblatta cylindrica*; front portion deplanate, thickly but minutely punctulate; eyes reduced, not projecting; interocular space very broad, slightly wider than the space between the antennal sockets; ocelli small, smoothly concave except for a few punctae in dorsal portion, irregular in outline. Maxillary palpi small, much as in *Poroblatta cylindrica*. Pronotum as given in generic description, length proportionately considerably greater than in *Poroblatta cylindrica*; latero-caudal angles weakly produced, appreciably less than ninety degrees, sharply rounded; caudal margin almost transverse, its lateral halves very feebly concave, showing a minute angulate production at their juncture mesad. Tegmina and wings absent. Mesonotum and metanotum with latero-caudal angles strongly produced, acute, their apices sharply rounded; the caudal margins, as a result, strongly concave, showing a minute angulate production mesad. Abdomen narrow and strongly convex, slightly wider than in *Poroblatta cylindrica*. Cerci entire, the acute apex very slightly projecting beyond the lateral curvature of the free margins of the adjacent segments. Distal portion of abdomen except cerci, limbs and their armament, pulvilli and arolia as given in the generic description of *Colapteroblatta*. Limbs shorter and heavier than in *Poroblatta cylindrica*.

Length of body, 24.6; pronotum, 8.3; caudal tibia, 5.2. Width of head, 5.2; pronotum, 8.2; abdomen at widest point, 9.8 mm.

Dorsal surface shining liver brown, becoming darker laterad on mesonotum and metanotum and darker both laterad and caudad on abdomen. Pronotum with lateral margins almost entirely ochraceous-buff, the decided punctae and cingulate margin bay, the dark mesal portion of the pronotum with margins suffused, forming an obtuse-angulate invasion laterad before the mesal point, its margins thence parallel to the caudal margin of the pronotum. Head with occiput chestnut, shading to deep liver brown above clypeus, ocelli and genae light buff, mouthparts warm buff. Limbs warm buff, the spines russet. Ventral surface of abdomen shining, buffy proximad rapidly shading through chestnut to blackish liver brown.

An additional single immature specimen, bearing the same data as the type, is before us. This individual is 14 mm. in length and is similar to the adult, except that the gland-like swelling of the lateral wings of the pronotum is not as conspicuous.

<sup>50</sup> From  $\alpha\delta\eta\nu$  and  $\phi\omicron\rho\alpha$  = gland carrier.

***Hormetica subcincta*** (Walker)

1868. *Brachycola subcincta* Walker, Cat. Blatt. Brit. Mus., p. 188. [♂, Colombia.]

1907. *Hormetica subcincta* Shelford, Trans. Ent. Soc. London, 1906, p. 507, pl. xxx, fig. 8. (Further data.)

Ibagüé, Tolima, 4000 feet, (from R. Shelford), 1 ♂, [A. N. S. P.].

This specimen is in every way typical. The limb armament, which has not been described, is as follows: Ventral margins of femora without heavy spines; cephalic femora with ventro-cephalic margin bearing distad a rather closely-set series of rather long chaetiform spines, ventro-caudal margins of median and caudal femora with a percurrent fringe of long hairs. Disto-dorsal genicular spine of median and caudal femora very greatly reduced.

Length of body, 25.8; pronotum, 9.8; exposed portion of tegmen, 7.2. Width of pronotum, 13.7; tegmen, 9.3 mm.

***Hormetica apolinari*** new species (Plate XVIII, fig. 4; plate XIX, fig. 7.)

The present insect represents a pale type of this distinctive genus, the most striking features being the dark head with pale occipital marking, pale pronotum and tegmina with conspicuous black patches.

The species belongs to the forms having the tegmina marked with black; of these *interna*, *strumosa* and *vittata* have a longitudinal marking, *apolinari* and *verrucosa* a median roughly triangular marking and *advena* a median marking which is very much more extensive.

Compared with its nearest ally, *verrucosa* Brunner, the present insect appears to differ in the striking pale occipital marking, pale borders of the pronotum, much more elongate tegmina and wings and in the tegmina having, in addition to a mesal black marking, a proximal black band, extending from the sutural margin to the humeral trunk and there continued distad for a distance nearly equalling its width.

*Type*.—♂; Fusugasugá, Cundinamarca, Colombia. Elevation, 5464 feet. February, 1917. (From A. Maria.) [Hebard Collection, Type No. 450.]

Size medium for the genus, form elliptical. Head broad; front flattened, polished, with scattered punctulae; interocular space very wide, but not as wide as width between antennal sockets. Pronotum with cephalic margin decidedly reflexed, sublamellate; cephalic and lateral margins evenly convex

and cingulate, this strongest cephalad; caudal margin truncate, very feebly convex; disk with two decided, blunt-conical protuberances latero-cephalad, between which it is strongly impressed and scabrous, this area bounded near the caudal margin of the pronotum by a broad and weakly raised ridge, which connects latero-cephalad with the protuberances. Tegmina extending to apex of abdomen, surfaces shining, showing under the microscope a close network of raised veinlets, so close proximad as to give a punctulate appearance. Wings extending to apices of tegmina but showing atrophy and useless for actual flight.<sup>51</sup> Ventral margins of femora without heavy spines, excepting a single heavy but greatly reduced distal spine on all but the caudal margin of the caudal femora, the largest being on the ventro-caudal margins of the median femora. Ventro-cephalic margin of cephalic femora with a distal row of chaetiform spines, by their irregularity clearly showing reduction in extent. Median and caudal femora with genicular spine heavy but greatly reduced, ventro-caudal margins well supplied with hairs. Tarsi unarmed, ventral surface of caudal metatarsus in distal two-thirds with a linear pulvillus, which broadens out roundly distad, succeeding three short joints each with ventral surface fully occupied by a large rounded pulvillus. Tarsal claws with proximal portion decidedly enlarged, arolia moderately developed.<sup>52</sup>

*Allotype*.—♀; same data as type, but taken March 11, 1917. [Hebard Collection.]

Size slightly larger than male. Pronotum less strongly specialized in contour, the cephalic and lateral margins about equally heavily cingulate but not sublamellate, the disk with latero-cephalic protuberances represented by very blunt sub-conical ridges, the median portion less strongly impressed. Tegmina and wings similar, but reaching only to base of supra-anal plate. Supra-anal plate chitinous, sub-bilobate in outline, dorsal surface weakly concave. Cerci short, not surpassing supra-anal plate, entire, rounding sharply to blunt apex. Subgenital plate very broad, scoop-shaped.

*Measurements (in millimeters)*

♂	Length of body	Length of pronotum	Width of pronotum	Length of tegmen	Width of tegmen	Length of caudal femur
<i>Fusugasugá, type</i> . . .	33	11.6	15.7	25.8	13.6	8.9
♀						
<i>Fusugasugá, allotype</i> .	36.7	11.8	16.2	25.8	13	8.8

Head black, a large, transverse oval marking of light ochraceous-buff occupying the interocular area; ocelli buffy, in the male this color is continued to the margin of the eye; clypeal suture broadly buffy. Antennae unicolorous, black. Pronotum ochraceous-buff, the areas occupied by the two latero-cephalic projections black with outline of these large blotches irregular, impressed area

<sup>51</sup> The supra-anal and subgenital plates are missing.

<sup>52</sup> A large portion of the species of the genus *Hormetica* are strikingly marked. For the separation of these, color characters have been almost exclusively used, these showing many excellent diagnostic features.

between these tawny. Tegmina opaque, ochraceous-buff; with a broad irregular proximal band of black from sutural margin to humeral trunk, a ray of this color extending caudad on humeral trunk a distance nearly the width of the band, and with a meso-lateral, irregular, rounded-trigonal black marking opposite the apex of the anal field, this marking more extensive in the male. Wings opaque, anterior field shining dresden brown, posterior field dull buffy brown with veins mummy brown. Dorsal surface of abdomen blackish, broadly margined laterad with buffy, supra-anal plate and cerci of female entirely blackish. Underparts of male blackish, a few flecks of buffy on the coxae and abdomen broadly margined laterad with buffy; of female solid blackish.

This beautiful insect is known from the single pair.

## MANTIDAE

### ORTHODERINAE

#### **Choeradodis rhombicollis** (Latreille)

1833. *Mantis rhombicollis* Latreille, in Humboldt and Bonpland, Obs., Zool., ii, p. 103, pl. xxxix, figs. 2 and 3. (No locality given.)

Las Mangos, (Juntas), Cauca, 1005 feet, II, 1907, (M. G. Palmer), 1 ♂, [A. N. S. P.].

La Maria, Cauca, 4700 feet, (M. G. Palmer), 1 ♀, [A. N. S. P.].

These specimens are typical of *rhombicollis* as discussed by Saussure and Zehntner. The inner face of the cephalic femora bears a large and shining black spot, through which the ungicular sulcus runs at about the distal third. A Central American series before us shows that the size of this spot varies individually, when reduced not extending beyond the ungicular sulcus. The pronotal form also shows considerable individual variation. As a result we feel satisfied that the features given by Saussure and Zehntner<sup>53</sup> to separate *C. servillei* from this species are of no specific value.

### MANTINAE

#### **Acontiothespis<sup>54</sup> iriodes** new species (Plate XVIII, fig. 5.)

This diminutive and beautiful insect shows nearest relationship to *A. cordillerae* (Saussure)<sup>55</sup> and *A. vitrea* (Saussure and Zehnt-

<sup>53</sup> Biol. Cent.-Amer., Orth., i, p. 126, pl. IX, figs. 1 to 3.

<sup>54</sup> New name for *Acontistes*, emended to *Acontista* by Saussure, as proposed by Rehn, Trans. Am. Ent. Soc., xlii, p. 258, (1916).

<sup>55</sup> It would appear probable that Saussure and Zehntner's *mexicana* and *mexicana* variety *quadrinaculata* are mere color variations of this species.

ner)<sup>56</sup>; a series of males of both of these species before us shows without exception the distal portion of the caudal femora blackish brown, while those of *vitrea* also have the cephalic limbs and caudal surface of the head very dark brown. In other respects males of *vitrea* agree closely with the type of *iriodes*, except that the tegmina and wings are distinctly more elongate in the former species. The colored tegmina and wings in males of *cordillerae* are distinctive.<sup>57</sup>

*Type*.—♂; Santa Marta, Magdalena, Colombia. December 26, 1910. [Hebard Collection, Type No. 460.]

Size rather small for genus, form moderately slender. Head with occiput distinctly raised above eyes. Ocelli prominent. Pronotum moderately elongate, margins cingulate, smooth; collar slightly longer than wide; shaft strongly constricted mesad, caudad of the decided supra-coxal enlargement, transverse sulcus distinct, with shallow weak sulci adjacent on collar, which broaden and diverge cephalad. Tegmina and wings fully developed, extending distinctly beyond apex of abdomen, but less elongate than in *fraterna* and *cordillerae*. Supra-anal plate strongly transverse, length about one-fourth basal width, free margin convex latero-distad, transverse mesad, showing very feebly a sub-bilobate condition. Cerci about twice as long as supra-anal plate, tapering to acute apex, joints feebly defined. Subgenital plate with free margin convex, showing a brief but sudden distal emargination, the portions laterad of this not bluntly acute-angulate produced as in *fraterna* and *cordillerae*. Limbs and their armament as characteristic for genus, their proportions as in *fraterna* and *cordillerae*. Features of coloration are important as specific diagnostic characters.

Length of body, 19.5; pronotum, 5.2; tegmen, 15.2; wing, 13.7; cephalic femur, 5.3; caudal femur, 4.8. Width of head, 3.7; pronotum at widest point, 2.2; tegmen, 4.2 mm.

Head oil green; eyes dresden brown, heavily suffused with oil green dorsad; antennae oil green briefly proximad, the remaining portions black; ocelli clay

<sup>56</sup> We here select the type locality for *vitrea* as Costa Rica. This insect may represent a geographic race of *cordillerae*, or merely the recessive extreme of coloration found in that species. Sufficient material to determine this definitely is not at present available.

<sup>57</sup> From Costa Rican material of *A. fraterna* (Saussure and Zehntner) at hand, we find that females of that species agree closely with those of *cordillerae* and *vitrea* except in being distinctly more slender; males of that species, however, in addition to this feature, are very strikingly and differently colored.

Through the kindness of Professor L. Bruner we have also been able to examine both sexes of *A. multicolor* (Saussure), from Trinidad. Females of that species would suggest small and remarkably brilliant individuals of *cordillerae* of intensive coloration. The males, however, show that the species is much more nearly related to certain South American forms (*A. eximia* and allies).



color. Pronotum oil green, extensively faded to brownish in this dried specimen. Tegmina glossy, colorless, hyaline, with principal veins lettuce green and veinlets paler green; marginal field lettuce green; stigma a minute dot of mummy brown. Wings glossy, colorless, hyaline, strongly iridescent, showing delicate metallic la-france pink and delicate metallic pale turquoise blue reflections; costal margin and veins probably lettuce green in life, faded to yellowish with traces of green in this dried specimen. Limbs immaculate lettuce green.

The type of this delicately beautiful insect is unique.

**Tithrone roseipennis** (Saussure)

1870. *A[contista] roseipennis* Saussure, Mittheil. Schweiz. ent. Gesellsch., iii, p. 229. [♀, Guiana.]

Pueblo Nuevo de Ocaña, Santander, IX, 3, 1916, (M. A. Carriker Jr.), 1♂, [Hebard Cln.].

Montamela, Cauca, 4900 feet, VII, 29, 1908, 1 juv. ♀, [U. S. N. M.].

Rio Aguatal, Cauca, 5250 to 7100 feet, VIII, 17 and XI, 1908, 1♀, 1 juv. ♀, [U. S. N. M.].

**Stagmomantis tolteca** (Saussure)

1861. *Mantis (Stagmatoptera) tolteca* Saussure, Rev. et Mag. Zool., 2e sér., xiii, p. 127. [[♀], "Mexico calida."]

Saussure subsequently states that in his opinion *tolteca* is merely a large and richly colored form of *S. carolina*. Scudder later considers that *tolteca* constitutes a geographic race of *carolina*. Burmeister's *Mantis dimidiata*<sup>58</sup> has been frequently incorrectly assigned as the green condition of either *carolina* or *tolteca*. That author later diagnosed his *dimidiata* more fully from a series of Argentinian localities,<sup>59</sup> and as the genus *Stagmomantis* is not found in that region, it is evident that his name applies to a species of some other genus.

Until *carolina* has been thoroughly and carefully studied, we prefer to use the name *tolteca* for the robust and, in the brown phase, richly colored, tropical condition.

Santa Marta, Magdalena, XII, 26, 1910, 1♀, [Hebard Cln.].

Cincinnati, Sierra Nevada de Santa Marta, Magdalena, 4000 to 5000 feet, VII, 1913, (M. A. Carriker Jr.), 1♀, [Hebard Cln.].

San Antonio, Cauca, 5900 to 6500 feet, X and XII, 1908, 2♀, [U. S. N. M.].

<sup>58</sup> Described from South America. Handb. Ent., ii, Abth. ii, pt. i, p. 539, (1838).

<sup>59</sup> Berliner Ent. Zeitschr., viii, p. 237, (1864).

The Cincinnati and San Antonio specimens are dark brown in general coloration and richly colored, agreeing in all respects with Mexican individuals before us. The Santa Marta individual is green.

**Macromantis ovalifolia** (Stoll)

1813. [*Mantis*] *ovalifolia* Stoll, Natuur Afbeeld. Beschryv. Spookten, etc., Spookten, p. 58, pl. xix, fig. 72, register p. 78. [♀, no locality given.]

Jiminez, Cauca, 1600 feet, III and VII, 1907, (M. G. Palmer; ♀ at rest under leaves), 1 ♂, 1 ♀, 1 juv. ♀, [A. N. S. P.].

Los Mangos, (Juntas), Cauca, 1005 feet, III, 1907, (M. G. Palmer), 1 ♀, [A. N. S. P.].

These huge Mantids are the largest examples of the species yet reported. They appear in every way typical, except that the marginal field of the male tegmen is much narrower than in a male before us from Igarapé-assú, Pará, Brazil, and distinctly narrower than in the first male of the species recorded, from La Mana, Guiana, as given by Saussure. The differences are sufficient to indicate possible racial or even specific distinction, for among the Mantidae the width of this field is usually extremely constant and an important specific diagnostic feature. Without more material, however, we do not feel justified in attempting separation in the present case.

♂	Measurements (in millimeters)				
	Length of body	Length of pronotum	Width of pronotum	Length of tegmen	Width of tegmenal marginal field
Jiminez, Cauca, Colombia . . . . .	101	35.9	8.2	78	4.7
La Mana, Guiana. (Ex Saussure) . . . . .	91	35	7	80	5.5
Igarapé-assú, Pará, Brazil . . . . .	97	34.7	7.8	74.3	6.2
♀					
Jiminez, Cauca, Colombia . . . . .	104	41.8	10.6	47.2	12
Los Mangos, Cauca, Colombia . . . . .	113	43.9	11.7	52.8	13.1
La Mana, Guiana. (Ex Saussure) . . . . .	92	35	9.5	41	12.5
La Mana, Guiana. (Ex Saussure) . . . . .	98	41	10	43	13.5

**Liturgousa mesopoda** Westwood

1889. *Liturgousa mesopoda* Westwood, Revis. Ins. Fam. Mant., p. 30, pl. xiii, fig. 10. [[♀], St. Laurent de Maroni, French Guiana.]

Jiminez, Cauca, 1600 feet, III, 1907, (M. G. Palmer), 1 ♀, [A. N. S. P.].

## MIOPTERYGINAE

**Pseudomiopteryx bogotensis** Saussure

1870. *P[sseudomiopteryx] bogotensis* Saussure, Mittheil. Schweiz. ent. Gesellsch., iii, p. 228. [♂, Bogotá, [Colombia].]

Cincinnati, Sierra Nevada de Santa Marta, Magdalena, 4000 to 5000 feet, VII, 10, 1913, (M. A. Carriker Jr.), 1 ♂, [Hebard Cln.].

San Antonio, Cauca, I, IV, 8 and 14, X and XI, 1908, 6 ♂, 1 ♀, [U. S. N. M.].

Jiminez, Cauca, 1 ♂, [A. N. S. P.].

The present series shows marked variation. Those from Cincinnati and Jiminez have the pronotum distinctly more elongate (4.7 and 4.8 mm.) and slightly more slender than in the San Antonio series (pronotal length, 3.9 to 4.2 mm.). This may be of specific or racial diagnostic importance. In three Costa Rican males before us of the very closely allied, if not synonymous, *P. infuscata* Saussure and Zehntner, variation is also found (pronotal length, 3.6 to 4.3 mm.), but in these the diameter is proportionate to the length, the proportions being as in the San Antonio series of *bogotensis*. The extremes of tegminal length (19.7 and 21.2 mm.) are found in the San Antonio series, the marginal field also varying in width (1.5 to 2 mm.).

No granulations of the facial scutellum are shown by any of the material at hand. This is a feature described by Saussure for the type of *bogotensis*. In other respects the series is perfectly typical, and we believe that a smooth and feebly tri-sulcate facial scutellum will be found to be the normal condition in *bogotensis*. It is clear that *bogotensis* and *infuscata* are very closely related, and that the latter name may prove to be synonymous, or at best of only racial value. Saussure and Zehntner, overlooking priority, suggest that *bogotensis* might represent a variety of their *infuscata*.

The spine of the lower ocellus, characteristic of the genus, is similarly developed in specimens of these species and in paratypes of *guyanensis* Chopard, now before us.

Chopard's *guyanensis* is very closely allied, the male having the facial scutellum moderately tri-sulcate, both sexes, when compared with *infuscata*, showing a greater development of the characteristic irregularities of the head, pronotum and abdomen. The male tegmina are much as in *infuscata*, but with marginal field broader, as in *bogotensis*. The striking limb coloration, as described by Chopard,<sup>60</sup> is probably the same in all these species; being similar in the males of all before us and showing the identical remarkable coloration in females of *infuscata* and *guyanensis*, the only species of which we have material of this sex.

It would appear very possible that the four known forms of the genus will be found to represent geographic races of a single species.

***Miopteryx granadensis* Saussure**

1870. *M[iopteryx] granadensis* Saussure, Mittheil. Schweiz. ent. Gesellsch., iii, p. 237. [♂, Bogota [, Colombia].]

This species was selected as genotype of *Miopteryx* by Rehn in 1904,<sup>61</sup> and Giglio-Tos' *Promiopteryx*,<sup>62</sup> with *granadensis* selected as genotype, consequently falls under *Miopteryx*.

Cincinnati, Sierra Nevada de Santa Marta, Magdalena, 4000 to 5000 feet, VII, 10, 1913, (M. A. Carriker Jr.), 1 ♀, [Hebard Cln.].

This specimen closely resembles a female before us of *M. simoni* Chopard, from Cariaquito, Venezuela, from which place we also have a male of that species.<sup>63</sup> These individuals show that females of the present genus lack tegmina and wings; weak convex production of the latero-caudal angles of the mesonotum and metanotum, even less decided than in *Pseudomiopteryx*, alone being indicated.

Without males from Cincinnati the determination can not be made with certainty, as the female sex has not been described of *granadensis* or Giglio-Tos' species, *simplex* (from Venezuela) and *fallax* (from Bogotá, Colombia). The insufficiency of the color

<sup>60</sup> Ann. Soc. Ent. France, lxxx, p. 325, (1911).

<sup>61</sup> Proc. U. S. Nat. Mus., xxvii, p. 566.

<sup>62</sup> Bull. Soc. Ent. Italiana, xlvi, p. 137, (1915).

<sup>63</sup> Differing from Chopard's description only in the almost complete absence of maculation.

character alone given to separate the unique specimen described as *fallax* from *granadensis*, taken at the same locality, indicates that the validity of *fallax* is highly doubtful.

The measurements of the specimen here recorded are as follows: Length of body, 16.8; pronotum, 5.5; cephalic coxa, 4.8; cephalic femur, 5 mm. Width of head, 3.7; of pronotum at widest point, 2.3 mm.

**Pogonogaster latens** new species (Plate XVIII, figs. 6 and 7.)

This remarkable mantid is not widely separated from the genotype, *P. tristani* Rehn.<sup>64</sup> It differs in having the pronotal collar proportionately slightly shorter, with the two median elevations represented by slightly raised swellings rather than blunt conical projections; the supra-coxal expansion not as decidedly produced on each side, these portions less delicate with margins not as strongly irregularly serrate; shaft with median carina distinct but lacking nodes, the flexure dorsad of the caudal portion not as sharp, the pair of nodes there found heavier and lower, as are the nodiform projections mesad on the caudal margin of the mesonotum, metanotum and median segment; abdomen with large and striking foliaceous plates only mesad on first, second and third dorsal segments, these irregular in outline but lacking spiniform marginal projections; succeeding abdominal segments only moderately cristate mesad, this strongest on fourth segment; supra-anal plate more bluntly rounded distad, and limb armament similar except that the minute microscopic denticulations of the margins of the cephalic coxae and proximal portions of the ventral margins of the cephalic tibiae are more numerous and even smaller, while the cephalic tibiae are supplied ventro-externally each with two minute spines curved distad.

*Type*.—♀; Rio Aguatal, Cauca, Colombia. Elevation, 5900 feet. November, 1908. [United States National Museum.]

Size medium; form very slender, except the abdomen which is moderately stout. Head crushed; ocelli obsolete. Pronotum elongate, collar nearly half as long as shaft, showing a large, moderately raised swelling meso-caudad and a lesser swelling meso-cephalad; pronotal margins microscopically denticulate; supra-coxal expansion with lateral portions triangularly produced, directed slightly cephalad, with apex bluntly rounded, the angle there formed slightly less than a rectangle; shaft with a distinct medio-longitudinal carina, shaft moderately bent dorsad near the caudal extremity and there supplied with a

<sup>64</sup> Trans. Am. Ent. Soc., xliv, p. 327, (1918). The type, a female, apparently nearly adult, from La Palma, Costa Rica, is in the Academy collection.

large rounded projection on each side of the median carina. Mesonotum and metanotum with a distinct medio-longitudinal carina, this raised and forming with the caudal margin a small, acute projection on each segment; tegminal and wing pads distinct, produced. Median segment with median carina weak but caudad more strongly produced dorsad than the metanotum, forming with the caudad margin a small acute projection. First, second and third dorsal segments with caudal half of dorsal surface produced dorsad in large, delicate, foliaceous plates, each plate so formed that its irregularly scalloped and bluntly angulate margins represent a continuation of the caudal margin of its respective segment; each of these segments with latero-caudal angles produced in a small, roundly subquadrate plate; fourth segment with a dorso-caudal projection much like that of the median segment but larger, this and the fifth segment with latero-caudal angles produced in still smaller, rounded plates; fifth and succeeding segments with their entire dorsal surfaces (due to their brevity) each occupied by a medio-longitudinal projection ascendent caudad, each similar to but distinctly smaller than that of the fourth segment. Supra-anal plate elongate shield-shaped, with a distinct medio-longitudinal carina, projecting as far as apex of subgenital plate, apex rather broadly rounded. Ventral abdominal segments each produced mesad at the caudal margin, forming with that margin a very small rounded projection directed ventrad. Limbs elongate and slender; cephalic limbs as in *tristani*, except as noted above. Subgenital plate developed distad in a valvular process nearly half as long as the distance from its base to base of subgenital plate, process with a medio-longitudinal ventral sulcation to its base, which is formed by a transverse, broadly V-shaped sulcation of the surface of the plate.

Length of body, 32; pronotum, 10.6; pronotal collar, 3.7; pronotal shaft, 6.9; process of first dorsal abdominal segment, 3.6; dorsal portion of supra-anal plate, 2.3; cephalic coxa, 7.4; cephalic femora, 9.8; cephalic tibia, 3; caudal femora, 10.2; caudal tibia, 10.4; caudal metatarsus, 5.7 mm. Width of pronotum at supra-coxal swelling, 2.9; pronotum at narrowest point of shaft, 1.1; process of first dorsal abdominal segment at widest point, 2.7; cephalic femur, .8 mm.

General coloration warm buff marbled and flecked with mummy brown. Abdomen with median portion of dorsum and median portion of foliaceous projections suffused with mummy brown. Ventral surface suffused with mummy brown. Cephalic coxa warm buff, flecked with mummy brown and with two median, irregular, transverse bands of this color on the external face. Cephalic femur light buff washed with mummy brown in three broad, irregular transverse bands. Cephalic tibia light buff with two internal irregular suffusions of mummy brown. Median and caudal limbs mummy brown with irregular annuli and flecks of light buff.

The type of this remarkable mantid is unique.

#### VATINAE

**Lobocneme colombiae** new species (Plate XIX, figs. 8 and 9.)

As in the genotype, *L. lobipes* (Redtenbacher), this species has the head more transverse and the supra-coxal dilation of the

pronotum more decided than in the species of the genus *Parastagmatoptera* at hand. The antennae are distinctly serrate, but not strongly so, as described for the male sex of *lobipes* and shown in males of *Parastagmatoptera* before us.

The generic position is easily recognized by the slight but distinct, rounded lobe distad on the ventro-caudal margin of the caudal femora,<sup>65</sup> confusion alone being possible with *Paroxyopsis*, in which genus the eyes are said to be more produced laterad. This lobe is much less strongly developed in *colombiae* than in *lobipes*.

The marginal field of the tegmina agrees more nearly with *Parastagmatoptera serricornis* Kirby<sup>66</sup> and *P. unipunctata* (Burmeister)<sup>67</sup> than it does with males of the other species of that genus at hand, but narrows more suddenly than in either of these.

*Type*.—♂; Santa Marta, Magdalena, Colombia. December 26, 1910. [Hebard Collection, Type No. 463.]

Size small for the group, distinctly smaller than *lobipes*; form slender. Head strongly transverse, width nearly two times depth, front distinctly concave, the eyes and adjacent portions of the head directed moderately laterocephalad; occipital outline weakly concave between the weakly arcuate-elevated juxta-ocular sections; ocelli well developed, arranged in a triangle; facial scutellum nearly three times as broad as deep, dorsal margins weakly concave-ascending to blunt median obtuse-angulation. Eyes showing very faintly a meso-lateral angulation. Antennae with joints serrate. Pronotum with margins supplied with numerous widely spaced, minute, microscopic teeth; collar comprising about one-fourth total pronotal length, distinctly constricted before the supra-coxal dilation; supra-coxal dilation decided, with sulci conspicuous. The tegmina reach to apices of cerci and are slightly surpassed by the wings; stigma present, small, longitudinal, linear; marginal field rather broad proximad, narrowing rather suddenly before median portion of tegmen. Supra-anal plate triangular, length half proximal width, subchitinous toward the bluntly rectangulate apex. Cerci scarcely four times as long as supra-anal plate, proximal joints fused for one-third cercal length, remaining eight joints distinct, the ultimate joint bluntly rounded distad. Concealed genitalia complex, resting in the produced subgenital plate; two large lobes, from beneath the sinistral of which project three specialized processes. Subgenital plate produced, length nearly twice proximal width; moderately convex mesad, the lateral and distal portions subdeplanate, this widest latero-distad; slightly constricted proximad, the lateral margins subparallel, weakly convex, the convexity increasing distad to the styles, between which the margin is transverse and less heavy in structure. Styles set in sockets on distal

<sup>65</sup> In the type the median limbs are missing.

<sup>66</sup> 1 ♂, Perené, Peru, [A. N. S. P.].

<sup>67</sup> 1 ♂, Embarcacion, Salta, Argentina, [A. N. S. P.].

margin of subgenital plate, minute, subcylindrical, feebly tapering to the bluntly rounded apex, each in length about two-fifths the distance between their bases. Armament of limbs as characteristic for the genera *Lobocneme* and *Parastagmatoptera*. Limbs slender, (but not as elongate as in males of the species of *Parastagmatoptera* examined). Median femora missing. Caudal femora with a slight, but distinct, rounded lobe immediately proximad of the genicular area on the ventro-caudal margin.

Length of body, 33.5; pronotum, 11.3; tegmen, 22.3; wing, 20.6; cephalic coxa, 7.2; cephalic femur, 8; caudal femur, 8.4; caudal tibia, 8 mm. Width of head, 5.4; pronotum at supra-coxal dilation, 2.4; tegmen at widest point, 5.8; tegmen in distal third, 4.9; marginal field of tegmen, 1.7 mm. Depth of head, 2.85 mm.

Head vinaceous-russet tinged with green caudad, except facial scutellum which is light buff. Eyes saccardos umber. Antennae orange cinnamon. Ocelli clear cadmium yellow. Green portions of insect evidently somewhat faded, probably all light oriental green in life. Pronotum green. Tegmina largely colorless hyaline, with veins very weakly green; marginal field opaque green, in this dried specimen showing a reddish discoloration in distal two-thirds, as do the apices of the wings; stigma buffy, glossy, linear (length, 1.8 mm.). Wings colorless hyaline, showing a weak iridescence, with veins very weakly green; costal margin opaque green. Abdomen yellowish brown, shading to green on the subgenital plate. Limbs green. Cephalic coxae with a longitudinal suffusion of blackish brown ventrad on the internal face, immediately before the genicular area. Cephalic femora with inner face mustard yellow shading to green dorsad, with minute brown dots at bases of alternate spines.<sup>68</sup>

The type is unique.

***Stagmatoptera septentrionalis* Saussure and Zehntner**

1894. *Stagmatoptera septentrionalis* Saussure and Zehntner, Biol. Cent.-Amer., Orth., i, p. 186, pl. viii, fig. 2. [♀; Bugaba, Panama.]

Santa Marta, Magdalena, XII, 26, 1910, 1 ♀, [Hebard Cln.].

Cauca, (F. Bonis), 1 ♀, [A. N. S. P.].

The Cauca specimen is nearly as large as the type, the Santa Marta individual considerably smaller. These specimens agree in all important features with Central American material of the species at hand.

*Measurements (in millimeters)*

♀	Length of body	Length of pronotum	Width of pronotum	Length of tegmen	Width of marginal field of tegmen
Ex Saussure, type . . . . .	96	38	—	51	8.3
Cauca . . . . .	85	34.8	8.9	52.2	8.8
Santa Marta . . . . .	76.5	31.7	7	40.9	7.3

<sup>68</sup> This insect appears to agree closely in the coloration of the cephalic limbs with *Paroxyopsis icterica* (Saussure and Zehntner), described from a female. That genus, from the female sex, appears to differ from *Lobocneme* in the differently shaped eyes, much narrower marginal field of the tegmina and transverse stigma.



**Phyllovates chlorophaea** (Blanchard)

1835. *Mantis chlorophaea* Blanchard, Mag. Zool., v, Ins., pl. 135. [♀; Watertown, New York. (In error.)]

Honda, Tolíma, V, 1913, 600 feet (from A. Maria), 1 ♂, [Hebard Cln.].

Fusugasugá, Cundinamarca, 5800 feet, XII, 1913, (from A. Maria), 1 ♀, [Hebard Cln.].

**Phyllovates stollii** (Saussure and Zehntner)

1894. *Theoclytes stollii* Saussure and Zehntner, Biol. Cent.-Amer., Orth., i, p. 192. [♀: Guiana; Brazil.]

Cincinnati, Sierra Nevada de Santa Marta, Magdalena, 4000 to 5000 feet, VII, 1913, (M. A. Carriker Jr.), 1 ♀, [Hebard Cln.].

## PHASMIDAE

## PYGIRHYNCHINAE

**Acanthoclonia erinaceus** Redtenbacher

1908. *A[canthoclonia] erinaceus* Redtenbacher, Insektenfamilie der Phasmeden, p. 62. [♀; Antioquia, Colombia.]

San Antonio, Cauca, 6600 feet, X and XI, 1908, 2 ♂, 1 ♀, [U. S. N. M.].

The female agrees fully with the original description except in being considerably larger<sup>69</sup> and in the metanotum, which besides being armed with the heavy pair of median composite spines is generally denticulate, but shows no two short, widely spaced spines cephalad worthy of special mention.

The dorso-external teeth of the first antennal joint are clearly variable; in the female at hand one of these joints has a heavy projection, showing a large and two smaller teeth, the other a similar projection showing a large and a small tooth. The males have but a single tooth distad.

Compared with the female, the males are in general similar, with homologous spines and laminate projections; differing in being decidedly more slender, with spined laminate processes as elongate but less composite, mesonotum and metanotum showing a low but decided medio-longitudinal ridge, the surface generally not as heavily rugose and denticulate. Abdomen differently armed as follows: first<sup>70</sup> and second dorsal segments each with

<sup>69</sup> The type may not be fully adult.

<sup>70</sup> We do not include the median segment as does Redtenbacher, hence our first dorsal abdominal segment is that referred to by that author as the second, and so forth.

a median pair of slender spines with few spinulae near bases; succeeding segments unarmed; auriform process of fifth less decided than in female; sixth, seventh and eighth segments carinate medio-longitudinally, with dorsal surface of carina rather broad and flattened; seventh segment expanding laterad, the remaining segments broadened so that the end of the abdomen is clubbed, its caudal margin irregularly serrate, the supra-anal plate produced to a strongly bilobate apex, the inner faces of these adjacent lobes heavily denticulate.

<i>Measurements (in millimeters)</i>					
♂	Length of body	Length of pronotum	Length of mesonotum	Length of metanotum <sup>71</sup>	Length of caudal femur
San Antonio.....	39.5	7.7	5.6	13.9	15.2
San Antonio.....	37.5	7.7	5.5	14	15.7
♀					
San Antonio.....	43	8.4	6.1	12	15.7

***Acanthoclonia strangulata*** new species (Plate XX, figs. 1, 2 and 3.)

This remarkable insect belongs to the forms of the genus showing no laminate projections on head and other segments of the body. The remarkable and very large pair of composite spines on the mesonotum show a transition from the type of the heavy pair of spined plates, as found in the species of the first section of the genus, to the much smaller and less striking pair of sub-composite spines, as found in the forms showing no laminate projections on head and other body segments.

It is noteworthy that, in apparently every species of *Acanthoclonia*, the position of plates and spines shows in some or many features a distinctive arrangement from that found in any other species. It is probable that the contrast between the sexes is a matter largely of degree, as discussed under *A. erinaceus* Redtenbacher.

The elongate mesonotum, which is decidedly narrower cephalad than caudad, and great number of spines on the body, are striking features in the present species.

*Type*.—♀; San Lorenzo, Sierra Nevada de Santa Marta, Magdalena, Colombia. Elevation, 8300 feet. August 23, 1913. (M. A. Carriker Jr.) [Hebard Collection, Type No. 451.]

<sup>71</sup> In the present paper the length of the metanotum, as given for the Phasmidae, includes the median segment unless otherwise stated.

Size large for genus. Antennae with first joint rounded rectangular, longer than broad, showing a feeble, longitudinal, proximal dorso-internal carina and bearing a decided, distal dorso-external spine.<sup>72</sup> Head with occiput gibbous, bearing three pairs of spines, the mesal pair largest, decided (length, 1.9 mm.), with a few small spines at bases, in addition there is a small pair of spines caudad of the antennal sockets, with a depressed area between these, and mesad on each cheek a stout spine, while other irregularly placed, small spiniform nodes occur. Pronotum subquadrate, with four spines on the cephalic margin, of which the two mesad are the smaller, a single small spine on the lateral margins above a small coxal spine, and a transverse row of four decided spines near the caudal margin, of which the two mesad are the largest. Mesonotum elongate, decidedly wider caudad than cephalad, lateral margins straight, divergent caudad; mesonotum with a pair of elongate, heavily spined processes (spiniform and not lamellate as in many species of the genus) (length 6.4 mm.), springing from a raised saddle near the caudal margin, these processes curving dorso-laterad, cephalad of these are two median pairs of equidistant moderate spines, between which is a pair of more widely spaced elongate spines (length, 2.2 mm.), while laterad near the lateral margins is a series (four and five) of widely spaced, smaller and somewhat irregular spines. The metanotum bears two pair of widely spaced, similar spines and two similar spines laterad near each lateral margin. The median segment is appreciably broader than long, and bears meso-dorsad near its caudal margin a pair of moderate spines (length, 1.9 mm.) with spinulae at their bases, in addition to two well-spaced, smaller spines mesad on each side. The first dorsal abdominal segment is similarly armed except that the meso-dorsal pair of spines is smaller and there is an additional spine at each latero-caudal angle. The succeeding dorsal abdominal segments to the sixth are similarly armed, with meso-dorsal pair of spines increasingly robust, those of the fourth, fifth and sixth segments forming rather twin spinose lamellate processes, the meso-lateral spines decrease in size distad, the spines at each latero-caudal angle increasingly robust to the eighth segment, those of the fourth and fifth forming lamellate plates each projecting as two triangles, of the sixth and seventh similar but horizontal (in normal position) and of the eighth forming a much larger, irregularly rounded lamellate plate. Meso-dorsad the seventh segment is supplied with small twin spines, the eighth and ninth with minute twin nodes, the meso-lateral spines are present as nodes on the seventh and obsolete on the eighth and ninth segments.

The ninth dorsal abdominal segment has its distal margin made up of large acute-angulate projections with apices rounded, a line drawn through these being convex. Between the sixth, seventh and eighth dorsal abdominal and its corresponding ventral segment, specialization of the soft integument evidently occurs; this is too shrivelled in the present specimen to describe accurately. Mesopleurum and metapleurum with a row of spines, the former with a supra-coxal swelling bearing three longer spines. Prosternum with a spine on each side just caudad of the insertion of the limb. Coxae and other

<sup>72</sup> Other portions of antennae missing in this specimen.

ventral portions moderately well supplied with spines. Operculum produced, free margin forming a median angle of less than ninety degrees with apex rather bluntly rounded. Femora with the two dorsal and the two ventral margins armed, the dorsal armament the heavier, this armament represented by spines proximad, developing rapidly into triangular spiniform plates, then decreasing near the extremities to heavy spines. Tibiae with ventral surfaces supplied proximod-mesad with a few small spines, supplied dorsal with an alternating series of triangular, spiniform plates, which decrease greatly in size distad. Tarsi with large pulvilli, occupying distal half of ventral surface of metatarsus and all of this area in the three succeeding joints. Large arolia present.

Length of body, 51.5; pronotum, 3.2; mesonotum, 10.4; metanotum, including median segment, 6.8; cephalic femur, 11.9; caudal femur, 13 mm. Width of mesonotum, cephalad, 2.9; mesonotum, caudad, 5.8; metanotum, 5.8 mm.

General coloration bistre and snuff brown, heavily marbled with microscopic black markings which give the insect a soiled appearance. Many of the plates on the limbs are almost solidly black. Many of the heavier spines are black tipped. The proximal abdominal spiracles are narrowly margined dorsad with greenish white.

The type of this remarkable spine-covered walking-stick is unique.

***Acanthoclonia carrikeri*** new species (Plate XX, figs. 4 and 5.)

The present species is so distinctive in several features that generic separation may eventually be found necessary. At present, however, the forms of this group are known from so few specimens and the differences between all the species of *Acanthoclonia* are so remarkable, that we do not feel justified in taking that step. Certain features, such as the spined occiput, general disposition of a large number of the spines and absence of spined lamellate processes on occiput and metanotum, agree best with *Mirophasma cirsium* Redtenbacher, but the great development of spinulose lobes on the abdomen, with other features, serves readily to separate that species.

The most striking features in the present species are: the antennae with first joint unarmed and succeeding joints straight and not enlarged distad; rather smooth dorsal surface between the spines and spinulae, and caudal metatarsus nearly as long as the combined length of the succeeding tarsal joints.

*Type*.—♂; La Palmeta, Santander, Colombia. Elevation, 7500 feet. July 15 to 20, 1916. (M. A. Carriker Jr.) [Hebard Collection, Type No. 467.]

Size very small for the genus, slightly less than that of *A. dicranum* Redtenbacher, smallest of the previously known species; form moderately slender for the genus. Antennae with proximal joint flattened, rectangulate, slightly longer than wide, unarmed; succeeding joints elongate, straight and not enlarged distad.<sup>73</sup> Head with occiput armed with two transverse arcuate rows of slender elongate spines, four in each row, of which the median-cephalic pair are slightly the largest, before these is a sub-approximate pair of decidedly smaller spines, and between these and the antennal sockets a more widely separated pair of larger slender spines. Pronotum rectangulate, appreciably longer than broad, armed mesad with an approximate pair of very elongate slender spines, behind these showing a rather broad transverse concavity, with a pair of minute approximate spinulae mesad at the cephalic margin and a heavier, longer, more widely separated pair of small spines mesad toward the caudal margin, each angle of the pronotum is also armed with a small slender spine directed laterad. Mesonotum narrowing evenly cephalad in cephalic two-thirds, narrowing slightly in caudal third, armed with a widely separated pair of elongate slender spines near the cephalic margin, and with an approximate pair of spines mesad at end of cephalic third, which are enlarged and supplied with a few spinulae at their attingent bases, armed with a transverse series of four elongate, heavy, composite spines at end of caudal third, the median pair of which are fused in proximal portion, the lateral spines of this series the longest on the insect, lateral margins supplied with elongate spinulae and a transverse series of four minute spinulae near the caudal margin. Metanotum with a similar, but much smaller, transverse series of four elongate, heavy, composite spines mesad, and with a lateral projection on each side above the coxa armed with a similar spine. Median and first dorsal abdominal segments showing rudiments of four spinulae mesad at their caudal margins, and with feeble smooth carinulae running from these laterad to near the latero-cephalic angles of these segments, such are found caudad as far as the seventh segment; second dorsal abdominal segment with four spines mesad, of which the cephalic pair are well developed and composite, these are found on each segment in decreasing size to the seventh where they are subobsolete. First to seventh dorsal abdominal segments with latero-caudal angles produced in small, irregularly rounded projections. Distal portion of abdomen moderately enlarged, cristate,<sup>74</sup> produced, terminating in two narrow vertical lobes, which internally are heavily denticulate. Cerci flattened, short, incurved. Subgenital plate short, truncate distad. Femora each with an acute, dorsal genicular projection and with all margins supplied with triangular plates, which are sharp at their apices, these largest meso-distad. Tibiae supplied with smaller triangular plates with apices sharply rounded. Tarsal joints slender and rather elongate, caudal metatarsus nearly as long as combined length of succeeding joints.

<sup>73</sup> In both paratypes the succeeding ten joints are elongate and slender, the remaining eleven or twelve joints much shorter, decreasing gradually in length from first of these, the thirteenth half as long as the twelfth.

<sup>74</sup> Slightly more pronounced and showing three serrations in the paratypes.

♂	Measurements (in millimeters)				
	Length of body	Length of mesonotum	Cephalic width of mesonotum	Length of metanotum	Length of caudal femur
La Palmeta, type . . . .	19.5	4	1.6	2.8	9.2
San Antonio, paratype	18.5	3.8	1.7	2.8	7.4
San Antonio, paratype	18	3.8	1.7	2.8	7.4

Type discolored. Paratypes moderately discolored, buffy suffused with brown. In one the pale proximal portion of the cephalic femora is pale green, suggesting that this may be the paler coloration in life. Head buffy with spines tipped with brown, as are all the heavier spines of the body. Antennae dark brown, annulate, proximal half of alternate joints buffy. Dorsal surface buffy with traces of a median brown line. Femora dark brown, except proximal portions which are buffy. Tibiae dark brown, irregularly annulate with buffy.

The species is known from the type and two paratypic males, in the United States National Museum, from San Antonio, Cauca, Colombia, at 6600 feet, taken in November, 1908.

#### ANISOMORPHINAE

**Anisomorpha atrata** new species (Plate XX, fig. 6.)

The general form and type of male genitalia is characteristic for the genus *Anisomorpha*. The metanotum is, however, not as long as the combined length of the head and pronotum, the cephalic femora are straight and all the femora are terete dorsad; these features have been supposed to be characteristic for *Autolyca*.<sup>75</sup>

The mesonotum is feebly armed, as in *A. paromalus* Westwood.

*Type*.—♂; San Lorenzo, Sierra Nevada de Santa Marta, Magdalena, Colombia. Elevation, 8300 feet. August 23, 1913. (M. A. Carriker Jr.) [Hebard Collection, Type No. 452.]

Size rather large for the genus, form robust. Head about as broad as long; vertex with a decided transverse dorsal impression between the antennal bases; lateral ocelli minute but distinct, laterad of which are shallow convex impressions, convergent caudad; occiput showing seven longitudinal sulci, of which the three situated mesad are weak, but the median sulcus is percurrent to the impression of the vertex. Antennae with internal margin of first joint

<sup>75</sup> Redtenbacher's separation of these genera is by no means satisfactory. The character of the first antennal joint is hardly of any value whatever, while that author contradicts himself in his statements as to the character of degree of development of femoral carinae. Insektenfamilie der Phasmiden, pp. 87 and 94, (1908). Examination of specimens in the Hebard Collection of the genotype, *Autolyca pallidicornis* Stål, shows far more important differences from *Anisomorpha* than would appear, from the literature, to exist, the male genitalia being of a particularly distinctive type.

pinched proximad. Pronotum longer than wide, surface shining, very feebly roughened, transverse sulcus distinct, medio-longitudinal sulcus very weak. Mesonotum shining, feebly roughened; armed with two pairs of small conical projections cephalo-laterad, and with a few (three and four) nodes proximo-mesad on the lateral margins. Metanotum and dorsal surface of abdomen polished, very feebly roughened; median and succeeding dorsal abdominal segments to and including sixth each supplied mesad, immediately before the caudal margin, with a minute, depressed, triangular projection, directed caudad. Supra-anal plate convex, slightly broader than long, lateral margins straight and parallel to a minute obtuse-angulate emargination, thence convex to the small, but decided, meso-distal emargination; thus the distal portion of the plate is bilobate, the free margins of these lobes thickened and armed ventrad with numerous and very minute teeth. Cerci straight, cylindrical, with apex bluntly rounded. Subgenital plate convex, short. Limbs moderately elongate; femora rounded dorsad, moderately deplanate laterad and weakly sulcate latero-distad; tibiae rounded; tarsi heavily supplied with hairs ventrad, so that the pulvilli are visible only meso-distad. Arolia small.

*Allotype*.—♀; same data as type. [Hebard Collection.]

Agrees with type except in the following features. Size much larger. Occipital sulci much weaker, subobsolete. The two pairs of conical projections of the mesonotum and the nodes (four and four) of the lateral margins more pronounced. Abdominal segments unarmed meso-distad. Supra-anal plate convex. Operculum with base on line with that of seventh dorsal abdominal segment, extending to apex of abdomen, with lateral margins weakly convex to the acute apex.

*Measurements (in millimeters)*

♂	Length of body	Length of pronotum	Length of mesonotum	Length of metanotum including median segment	Length of cephalic femur	Length of caudal femur
<i>Type</i> . . .	31	2.8	4.7	4.2	9.3	10.4
♀						
<i>Allotype</i> . .	49.5	4.9	8.4	7	12.4	15

General coloration solid blackish chestnut brown, limbs paler distad, shading there to ochraceous-tawny. Antennae blackish brown, strikingly buffy at the intersections of the joints.

The type and allotype are all we have seen of this interesting insect.

PSEUDOPHASMINAE

***Stratocles viridis*** new species (Plate XXI, fig. 1.)

This insect is distinctive in having almost the entire dorsal surface, excepting the head, green, and the caudal area of the wings dark, except for a large circular mesal white area. In this latter respect the insect agrees alone with *S. rufipes* Redtenbacher, but differs in the considerably larger size, much more extensive green coloration and other differences of color distribution.

With these species, *S. bennetti* (Gray) and *S. bogotensis* Kirby are clearly closely related, as shown by the very short mesonotum and general type of coloration; the former, however, has the caudal area of the wings immaculate, the latter has this area smoky hyaline, with a broad curved milk-white band across the middle, not extending to either margin, in addition to other differential features, particularly of coloration.

*Type*.—♀; Muzo, Boyaca, Colombia. Elevation, 2700 feet. August, 1915. (From A. Maria.) [Hebard Collection, Type No. 453.]

Size medium for the genus. Head with meso-caudal portion of occiput slightly depressed, bounded laterad by brief and shallow longitudinal carinae, and also with a median carina weak but percurrent to the three rather well-developed ocelli, which are rather closely placed on a raised heart-shaped area, the vertex before the median ocellus showing a minute, but decided, depression. Antennae nearly as long as body. Pronotum decidedly longer than the very short mesonotum, mesonotum not elevated caudad. Tegmina irregularly ovate, shoulders raised but bluntly rounded. Wings extending to apex of abdomen. Abdomen smooth to ninth dorsal segment, which is strongly convex, with lateral margins straight to near base of cerci, thence broadly and weakly concave to mesal sixth of margin, which is slightly less broadly and more strongly concave, leaving the convex apex of the supra-anal plate briefly exposed. Cerci slender, simple, hairy, very feebly incurved to the rather sharply rounded apex. Operculum elongate, hairy, free margins distad convex-convergent to the apex, which is directly beneath the apex of the supra-anal plate. Cephalic femora straight, all femora rounded above. Tibiae rounded, hairy. Tarsi hairy, thickly supplied with coarse hairs ventrad, concealing pulvilli. Arolia very small. Many features of coloration are of great diagnostic value, specific structural differences in the present genus have been much neglected in the descriptions of the species of the genus.

Length of body, 45; pronotum, 3.7; mesonotum, 2.3; tegmen, 6.2; wing, 37.8; cephalic femur, 9.7; caudal femur, 13.8; caudal tibia, 14.2 mm. Width of pronotum, 2.5; dorsal portion of tegmen, 3; wing, 20.2 mm.

General coloration civette green. Head pale yellowish green, with heavy postocular longitudinal bands of black, and between these irregular occipital bands of the same coloration. Mouthparts and antennae black, the two proximal antennal joints showing weak maculations of pale greenish. Pronotum and mesonotum rinne's green, suffused meso-laterad with black. Lateral field of tegmina shining jet black, dorsal field civette green with veins black. Wing with lateral field shining jet black, except in proximal two-thirds of area between mediastine and humeral veins which is solidly civette green proximad, becoming paler, whitish and less extensive distad; dorsal field civette green with veins black; posterior field transparent, heavily suffused with black, except for a large, roughly circular, median area suffused with white (10.2 by 10.8 mm.). Metapleura black, with a median and ventral longitudinal



band of green. Abdomen with dorsal surface black, lateral margins of segments and caudal margin of distal segment greenish. Entire ventral surface of insect green. Femora civette green, distad lined with black dorsad and laterad, these lines broadening distad. Cephalic tibiae black, median and caudal tibiae suffused green, black dorso-distad. Cerci and tarsi black, the hairs yellowish.

The type of this strikingly beautiful insect is unique.

#### **HOLCOIDES** new genus

The present genus is readily separable from others of the *Stratocles* Section of the Phasmini by the femora and tibiae all being terete, both dorsad and ventrad. In Redtenbacher's key the genus would stand nearest *Parastratocles*.

*Genotype*.—*Holcoides forceps* new species.

*Description of Genus*.—Head elongate, nearly twice as long as width between eyes; ocelli distinct. Antennae elongate, segments increasing greatly in length distad, the very elongate distal segments divided into numerous joints. Head, pronotum and mesonotum smooth. Mesonotum shorter than metanotum; with a decided medio-longitudinal sulcus in slightly less than proximal half, which is bounded laterad by rounded carinae; lateral margins strongly cingulate. Tegmina short, truncate. Wings fully developed. Male disto-dorsal abdominal segment highly specialized. Mesosternum evenly convex in transverse section. Cephalic femora with cephalic flexure distinct. All femora and tibiae terete both dorsad and ventrad.

***Holcoides forceps*** new species (Plate XXI, figs. 2, 3 and 4.)

This species is of particular interest in showing not only an unusual type of limb structure, but also distinctive male genitalic features.

The general appearance of the insect agrees very closely with that of *Holca annulipes* Redtenbacher<sup>76</sup>; that species differing widely, however, in the carination of the femora, sulcation of the cephalic tibiae, the percurrent sulcus and granulation of the mesonotum and black radial vein of the tegmina.

*Type*.—♂; San Antonio, Cauca, Colombia. Elevation, 6600 feet. January, 1909. [United States National Museum.]

Size medium, form slender. Head smooth, elongate; cheek slightly over twice as long as eye; ocelli distinct, median ocellus situated in an abrupt and distinct pit. Antennae nearly as long as body, segments increasing greatly

<sup>76</sup> Insektenfamilie der Phasmiden, p. 114, pl. iv, fig. 16, (1908).

in length distad, the very elongate distal segments divided into numerous (eight to twelve) short and less strongly defined joints. Pronotum smooth, length about one and three-quarters times width, longitudinal and transverse sulci very weak. Mesonotum as given in generic description; carinae of proximal medio-longitudinal sulcus and cingulate lateral margins polished, all finely and irregularly impresso-punctulate. Tegmina short, margin of lateral field broadly convex; dorsal field truncate distad, angle at the sutural margin very slightly the more produced, distal margin nearly transverse, very feebly convex. Wings fully developed, extending to base of seventh dorsal abdominal segment. Dorsal abdominal segments elongate to seventh, which is much shorter, about as long as wide; eighth slightly longer, widening distad. Ninth (distal) dorsal abdominal segment ascendant and somewhat tectate proximad for a distance equalling the length of the preceding segment, thence, due to the great production of the disto-ventral portions, furcate, the arms tapering strongly in proximal portion, due to the declivity of the dorsal margin, thence slender, produced to their sharply rounded apices which touch on their inner faces, internal surface of these arms supplied with minute short hairs and thickly armed with minute chitinous denticulations. Cerci elongate, straight to their bluntly rounded, incurved apices. Subgenital plate short, slightly shorter than eighth dorsal abdominal segment, free margin convex, except in distal portion where it is bilobate. Limbs as given in generic description. Arolia present.

Length of body, 48; head, laterad, 3.8; pronotum, 2.8; mesonotum, 4.9; tegmen, 3.8; wing, 32.8; ninth (distal) dorsal abdominal segment, 3.2; cercus, 2.3; cephalic femur, 12.6; cephalic tibia, 11.7; caudal femur, 10.3; caudal metatarsus, 2.1 mm. Width of head, behind eyes, 2.1; dorsal field of tegmen, 1.8; lateral field of tegmen, 1.2; abdomen before apex, 1.2; abdomen at widest (distal) point, 1.7 mm.

Head light brownish olive; with two narrow, longitudinal, postocular bands on each side of cinnamon-buff margined with sepia, of which the dorsal band is the widest; face and mouthparts cinnamon-buff. Antennae walnut brown proximad, each joint beyond the first two deepening to blackish brown distad, very elongate distal joints gradually becoming paler distad, the more distal with proximal portion light buff, the distal portion suffused, shading to walnut brown at apex. Pronotum and mesonotum light brownish olive, lateral carinae of latter cream buff. Tegmina walnut brown, the veins slightly paler; intermediate field paler, cacao brown; areas between veins suffused with burnt umber toward sutural margin in dorsal field. Anterior field of wings rood's brown, except along the caudal margin where it is pinkish buff heavily and irregularly maculate with longitudinal markings of burnt umber; radial field transparent, avellaneous. Mesosternum ochraceous-buff, suffused with rood's brown mesad. Metapleura and metasternum rood's brown, the soft integument between these portions buffy. Abdomen cinnamon above, clay color below; the fourth, fifth and sixth dorsal segments with two pairs of small blackish brown flecks, of which those of the cephalic pair are the largest and less widely spaced. Limbs ochraceous-buff, the extreme tips of the femora

and bases of the tibiae black, all the femora and the median and caudal tibiae each showing two wide, but very faint, bands of ochraceous-tawny.

The antennal coloration and the unusual marking of the internal margin of the anterior field of the wings, and of the limbs, all are found in the otherwise apparently widely separated *Holca annulipes* Redtenbacher.

The type of this interesting species is unique.

***Pseudophasma*<sup>77</sup> *taeniatum*** new species (Plate XXI, fig. 5.)

This insect agrees with *P. robustum*, described in the present paper, in the decidedly robust form and abbreviate wings. The latter extend but slightly beyond the apices of the caudal femora and are clearly useless for sustained flight, though they can probably be employed as parachutes. Very decided difference from *robustum* is found in the nodulose occiput, differently colored antennal joints much more strongly defined, exceptionally short mesonotum, distinctive venation of tegmina, broad medio-longitudinal pale band of the anterior field of the wings, unicolorous limbs and bluntly rounded apex of operculum.

*Type*.—♀; San Antonio, Cauca, Colombia. Elevation, 6600 feet. November, 1908. [United States National Museum.]

Size smaller than *robustum*, form robust. Head very slightly longer than wide; occiput with six irregular rows of widely spaced nodules. The three ocelli minute, but not as much reduced as in *robustum*, not closely crowded, forming the apices of an equilateral triangle, the surface about each feebly raised, the depression before the median ocellus decided. Antennae with joints weakly but distinctly enlarged distad, excepting the elongate distal joints, which are subdivided into short segments. Pronotum with surface roughened and with a few weak nodules. Mesonotum extremely short, considerably shorter than pronotum, with surface decidedly roughened, with three decided and closely placed tubercles on each lateral margin and one decided pair laterad on the dorsum, with a pair of nodes cephalad and caudad, in which region the surface is generally nodulose. Tegmina of normal length for genus; production decided at sutural angle; shoulders compressed with outline irregularly convex, due to the varicose condition of the veins, which though prominent in the dorsal field are decidedly more thickened and raised on the shoulders; distal margin of dorsal field evenly and weakly convex to the rather broadly rounded angle at the sutural margin, sutural margin very feebly convex. Wings reduced, extending only very slightly beyond apices of caudal femora; anterior field broad. Distal portion of abdomen apparently as described for *robustum* (dorsal segments distorted), except that the angle formed by the apex of the operculum is only slightly less than a right angle and is bluntly rounded. Cephalic femora with cephalic flexure moderate, slightly weaker

<sup>77</sup> The necessity of following Kirby in the use of this name for *Phasma* of authors (not of Lichtenstein as restricted) is fully explained by Rehn. Proc. Acad. Nat. Sci. Phila., 1904, p. 95, footnote 43, (1904).

than in *robustum*. All femora and tibiae with four carinae conspicuous. Tarsi heavily supplied with hairs on ventral surfaces, the small distal pulvilli almost concealed. Moderate arolia present.

Length of body, 50; dorsal surface of head, 4; pronotum, 5; mesonotum, 3.7; tegmen, 7.2; wing, 27.2; cephalic femur, 12.7; median femur, 11.8; caudal femur, 16.7 mm. Width of head, 4.2; pronotum, caudad, 3.9; mesonotum, 4.7; dorsal field of tegmen, 3.3; wing, 19 mm.

General coloration black. Head black with a suffused postocular band on each side of sayal brown, mouthparts buffy. Antennae with two proximal joints blackish, other joints sayal brown, their apices suffused with blackish, this suffusion extending on the dorsal surface of each of the proximal joints to near its base. Pronotum black, the lateral margins narrowly sayal brown cephalad. Other portions of body and limbs solidly black, the thick hairs of the ventral surfaces of the tarsi sayal brown. Tegmina velvety black, the enlarged and raised veins cinnamon-buff, except toward the sutural margin where they shade to cinnamon; in consequence of the very unusual enlargement of the veins on the shoulders, these portions are almost entirely cinnamon-buff. Wings with lateral portion of anterior field blackish, dorsal portion divided into three broad longitudinal bands, the external band blackish (concolorous with the adjacent lateral portion), the median band striking sayal brown, the internal (sutural) band velvety black; posterior field immaculate, avellaneous.

The type is unique.

***Pseudophasma robustum*** new species (Plate XXI, Fig. 6.)

This robust species is particularly distinctive in the abbreviation of its wings, these extending but slightly beyond the apices of the caudal femora. The distinctively annulate antennae, dark tegmina with velvety black area obsolete, immaculate posterior field of the wings and limbs reddish brown in proximal half, blackish brown in distal half, are other features of decided diagnostic importance. Under *P. taeniatum*, here described, these two species are fully compared.

From the brief description of *P. unicolor* (Gray), nearest relationship of that insect would appear to exist with *robustum*; in that species the size is smaller, the antennae differently annulate, the wings longer and the posterior field of the wings differently colored.

*Type*.—♀; Cincinnati, Sierra Nevada de Santa Marta, Magdalena, Colombia. Elevation, 4000 to 5000 feet. July, 1913. (M. A. Carriker Jr.) [Hebard Collection, Type No. 454.]

Size medium for the genus, form robust. Head simple, much as in *P. phthisicum* (Linnaeus),<sup>78</sup> with three, very feeble, longitudinal occipital sutures and the

<sup>78</sup> Of which species, the genotype, we have material from French Guiana, determined by Chopard as the synonymous *P. necydaloides* (Johannson).

three ocelli minute, not closely crowded, forming the apices of an equilateral triangle, the surface about each hardly raised, the depression before the median ocellus very weak. Pronotum with surface slightly roughened. Mesonotum with surface decidedly roughened and with a few tubercles near the lateral margins and laterad on the dorsum, of which latter the second pair are decided, the third (caudal) pair only a little less pronounced. Tegmina reduced, short; shoulders strongly compressed, moderately depressed, outline strongly convex, showing no angulation; caudal margin of dorsal field oblique, weakly concave to sutural margin, as a result only a vestige of the area remains in which the velvety marking, so conspicuous in many species of the genus, is developed; network of veins heavy. Wings reduced, extending only slightly beyond apices of caudal femora. Disto-dorsal abdominal segments with a medio-longitudinal keel, seventh and eighth with keel slightly raised and bluntly rounded distad. Ninth dorsal abdominal segment not as broad dorsad as in *phthisicum*, with distal margin moderately concave, leaving exposed the minute supra-anal plate with margin convex. Cerci short, stout. Operculum with lateral margins straight, convergent distad to the acute apex, which is situated beneath the cercal bases. Cephalic femora with cephalic flexure moderately decided; all femora and tibiae with four carinae conspicuous. Tarsi heavily supplied with hairs on ventral surfaces, the large distal pulvilli of the four proximal joints not concealed. Moderate arolia present.

Length of body, 57; dorsal surface of head, 4.3; pronotum, 4.5; mesonotum, 5.7; tegmen, 6.6; wing, 31; cephalic femur, 16.3; median femur, 12.8; caudal femur, 8.4 mm. Width of head, 4.1; pronotum, 3.4; mesonotum, 4.3; dorsal field of tegmen, 3.6; wing, 21 mm.

General coloration dirty blackish brown. Head mummy brown mottled with prout's brown, with a paler, buckthorn brown, broad postocular band. Pronotum and mesonotum mummy brown, obscurely mottled with prout's brown. Lateral field of tegmina dull black, dorsal field brownish black. Wings with lateral portion of anterior field brownish black, dorsal portion brownish black except proximad, where it lacks heavy pigmentation and is buffy<sup>79</sup>; posterior field subtransparent, immaculate, pale ochraceous-salmon. Abdomen and ventral surface blackish brown. Proximal half of femora tawny, distal half black. Tibiae and tarsi tawny. Antennae black, except proximal half of sixth, eighth and tenth joints which are ochraceous-tawny, the succeeding alternate joints similarly annulate but becoming paler distad, ochraceous-tawny and buckthorn brown.

The type alone has been examined.

***Pseudophasma eupeplum*** new species (Plate XXII, fig. 1.)

This large and handsome species shows close relationship to *P. fulvum* (Redtenbacher), differing in the shorter mesonotum, distinctive tegminal and wing coloration and sharply acute operculum.

<sup>79</sup> This is briefly visible beyond the tegmina when at rest, due to the emargination of the distal portion of the tegmina.

The similarity in general type of antennae, wing and limb coloration and small meso-caudal tubercles of the seventh and eighth dorsal abdominal segments in the female, indicate that the very different generally appearing *P. robustum*, here described, probably belongs to the same group in the present genus. Males of these species must be obtained before this can be definitely determined.

*Type*.—♀; La Palmeta, Santander, Colombia. Elevation, 7500 feet. July 15 to 20, 1916. (M. A. Carriker Jr.) [Hebard Collection, Type No. 468.]

Size large, form moderately robust. Head distinctly longer than wide; occiput smooth, except for a few, very minute microscopic nodes which occur in the greatest numbers caudad of the antennal sockets. The three ocelli small, not closely crowded, forming the apices of a triangle, the sides of which are slightly longer than its base caudad, the surface about each ocellus distinctly raised, the depression before the median ocellus deep. Antennae with each joint very feebly enlarged at apex, except the elongate distal joints which are subdivided into short segments. Pronotum smooth, except for scattered, very minute, microscopic nodes. Mesonotum slightly longer than pronotum, with surface nodulose, bearing (three to five) slender, blunt tubercles on each lateral margin and three pairs of similar projections proximo-laterad on the dorsum. Tegmina normal for genus, produced moderately at sutural angle; shoulders strongly compressed, with outline flattened convex; distal margin of tegmen weakly concave, oblique to rather broadly rounded angle at sutural margin, that margin broadly convex. Wings fully developed, extending to base of ninth dorsal abdominal segment. Seventh dorsal abdominal segment produced in a small median tooth just before the caudal margin; eighth with a similar but slightly more decided tooth mesad on the caudal margin; ninth with a medio-longitudinal carina distinct distad, distal margin obtuse-angulate emarginate; supra-anal plate minute. Styles short, straight, tapering to blunt apex. Operculum broad lanceolate, apex acute. Cephalic femora with cephalic flexure very weak; all of the limbs with the four carinae decided. Tarsi moderately heavily supplied with hairs on ventral surfaces, the rather large distal pulvilli of the four proximal joints not concealed. Moderate arolia present.

*Measurements (in millimeters)*

♀	Length of body	Length of pronotum	Length of mesonotum	Length of tegmen	Length of wing	Length of cephalic femur
<i>Type</i> . . . . .	75	5.4	5.8	8.7	55.5	18.8
<i>Paratype</i> . . . . .	72	5.2	5.5	9.1	54	18.6

*Type*.—Length of dorsal surface of head, 4.3; median femur, 14.8; caudal femur, 20.3 mm. Width of head, 4.1; pronotum, 3.8; mesonotum, 3.8; dorsal field of tegmen, 4.8 mm.

Head saccardos olive; occiput microscopically marked with four longitudinal blackish lines; two broad postocular bands of ochraceous-buff on each side,

separated by a blackish line. Antennae black with nine conspicuous and three less conspicuous annuli of pinkish buff, these covering all but the apices of alternate joints proximad, but extending over only the proximal half of the alternate long distal joints. Pronotum saccardos olive obscurely marked with buffy and brown, the microscopic nodes buffy. Mesonotum similar with nodules buffy. Other portions of body sepia, shading through saccardos umber to tawny olive distad on abdomen. Tegmina with lateral field saccardos umber tinged with sepia, particularly distad; narrow intermediate field pinkish buff, including the proximal portion of the radial vein; dorsal field saccardos olive, the shoulders black, this extending as a dark suffusion caudad to near the caudal margin. Wings with anterior field immaculate buffy citrine, the veins and veinlets old gold; posterior field transparent, seashell pink, with veins pinkish cinnamon, showing a very weak grayish suffusion along the peripheral margin, which narrows rapidly from the distal portion. All femora snuff brown in proximal three-quarters, distal quarter black except apex, which is pinkish buff. Tibiae snuff brown except at immediate base, which is pinkish buff, and distal fifth, which is blackish. Tarsi blackish brown.

In addition to the type, a paratypic female bearing the same data is before us.

**Pseudophasma bispinosum** (Redtenbacher)

1906. *Ph[asma] bispinosus* Redtenbacher, Insektenfamilie der Phasmiden, p.

122. [♂, ♀; Coca, Santa Inez, Ecuador.]

Susumuco, Cundinamarca, 2600 feet, IV and VIII, 1912, IX, 1913, (from A. Maria), 2 ♂, 1 ♀, [Hebard Cln.].

These specimens are decidedly more depauperate than the types, but appear to be in no way separable.

*Measurements (in millimeters)*

♂	Length of body	Length of mesonotum	Length of tegmen	Length of wing	Length of cephalic femur	Length of caudal femur
Susumuco . . . . .	49	4.4	5.1	35	17.6	16.2
Susumuco . . . . .	50	4.5	5.1	35.7	16.8	16.2
♀						
Susumuco . . . . .	65	5.5	9.2	53.5	19.4	18.4

**Euphasma salpingus** (Westwood)

1859. *Phasma salpingus* Westwood, Cat. Orth. Ins. Brit. Mus., Phasmidae, p. 119, pl. xxxiii, figs. 3 and 3a. [♀; Bogota, Colombia.]

Susumuco, Cundinamarca, 2600 feet, (from A. Maria), 2 ♀, [Hebard Cln.].

The specimens before us are typical of this beautiful insect, striking in the annulate yellow and brown antennae, brown limbs marked with yellowish and mottled olive and brown tegmina and anterior field of wings.

**Planudes cortex** new species (Plate XXII, figs. 2, 3 and 4.)

This insect shows remarkable dissimilarity in the sexes; the male slender and having fully developed organs of flight, the female moderately stout and showing only the merest vestiges of tegmina. The dissimilarity in form is slightly more pronounced than in *Creoxylus spinosus* (Fabricius),<sup>80</sup> in which species, also a member of the Prexaspes Division, similar sexual differences in the organs of flight are found, these in neither case being of any generic diagnostic value.

In a species such as the present, showing no lobation of the limbs or conspicuous projections of the body, it is very difficult to associate the sexes. In body proportions, the female, though decidedly heavier, agrees with the male in proportionate length of head, pronotum and mesonotum, and these portions, though much more heavily nodulose, show a general similarity of contour and structure. The limbs in the female are all stouter, the cephalic femora distinctly more lamellate and the tarsal joints shorter than in the male, but the relative proportions of the cephalic and caudal limbs are the same in both sexes; these features show similar differences in the sexes of *Creoxylus spinosus* but to a slightly lesser degree. The sculpture of the head in the ocellar area and facial scutellum, the black basal joints of the palpi, the hirsute antennae, the length of which differ in approximately the same ratio as found in the sexes of related species, and the similarly developed carinae of the limbs (except the greater lamellation of the cephalic femora in the female), all of which are similarly strongly hirsute, give us reason to believe this association to be correct.

The female shows the close relationship of the species to *P. molorchus* (Westwood), apparently differing in having vestigial tegmina, the fifth dorsal abdominal segment simple and the form slightly heavier, the mesonotum and metanotum distinctly shorter.

The male, in Redtenbacher's key, would run to his *Isagoras plagiatus*, from which species this specimen is readily distinguished by the dissimilarity of proportions, this most striking in the caudal femora being distinctly longer than the cephalic.

<sup>80</sup> A large series of this species from Trinidad is in the Hebard Collection.



*Type*.—♀; San Antonio, Cauca, Colombia. Elevation, 6600 feet. October, 1908. [United States National Museum.]

Size medium; form moderately stout, the body width nearly subequal throughout. Head moderately elongate; occiput supplied with nodules arranged in irregular longitudinal lines, slightly swollen caudad, there showing three brief sulcations caudad; ocelli obsolete, ocellar area weakly convex except meso-cephalad where a shallow rectangulate pit occurs, with angles median and lateral; facial scutellum impressed, dorsal and ventral margins parallel, arcuate dorsad, rounding sharply into brief and more strongly raised lateral margins, which are directed dorso-laterad. Antennae with joints simple, moderately hirsute. Pronotum with transverse and medio-longitudinal impressions distinct, about as long as head, supplied with nodules about as thickly as occiput, with a few of these larger meso-caudad. Mesonotum slightly over three times as long as pronotum, surface thickly supplied with nodules and irregularly rugulose with a few scattered nodes, with microscopic vestiges of tegmina at the latero-caudal angles. Metanotum over two-thirds as long as mesonotum, moderately nodulose as are also the proximal abdominal segments; median segment half again as long as metanotum. Tegmina represented by minute, vestigial, roughened pads; wings absent. Proximal dorsal abdominal segments decidedly longer than broad. Disto-dorsal abdominal segments apparently cristate, the ninth truncate distad. The soft integument between the dorsal and ventral sixth abdominal segments is on each side produced in a moderately lamellate projection, very weakly undulating with margin trilobate. Mesosternum and metasternum rugulose. Operculum elongate with margins parallel to distal portion, which is angulato-convex. On each side of this distal portion of the operculum is a large, longitudinal, vertical plate, over twice as long as broad, with margins feebly convex-convergent to its acute apex.<sup>81</sup> Cephalic femora strongly compressed, with cephalic flexure well developed, showing (four to five) weak undulations of the ventral margin and (two) of the dorsal margin in the portion of greatest width, length less than that of caudal femora. The carinae of the limbs are pronounced and all are decidedly hirsute. Pulvilli rather large. Arolia well developed.

*Allotype*.—♂; Villa Eloira, Cauca, Colombia. Elevation, 5900 feet. September 5, 1908. [United States National Museum.]

Very dissimilar in general appearance from female. Size nearly as large, form much more slender. Head similar but very much smoother, the nodules much fewer and smaller; as in the male of *Creoxylus spinosus*, the eyes are more protuberant and larger in proportion to the size of the head than in the female. Pronotum similar to that of female but much smoother, with only a few scattered minute nodules. Mesonotum with a feeble medio-longitudinal sulcus, very feebly rugulose with a few scattered nodules and minute nodes.

<sup>81</sup> These plates, called "appendix styliformis" by Redtenbacher, serve to hold an egg after it has been extruded. One of the eggs was in this position in the specimen before us. It is broad oval, flattened at each end, the surface of the excorion or shell rough and thickly supplied with short sharp spines, all directed cephalad.

Tegmina ample, lateral field narrow, apex mesad in dorsal field, outline ovate, shoulders moderately inflated and considerably raised, their outline convex. Wings fully developed. Abdomen missing. Limbs differing from those of female only in features discussed above, the margins of the decidedly less lamellate cephalic femora showing no undulation, except that caused by the characteristic expansion beyond the weak cephalic flexure.

*Type*, ♀.—Length of body, 60.5; pronotum, 3.8; mesonotum, 11; metanotum, including median segment, 8.8; tegmen, 1.2; cephalic femur, 10; median femur, 8.7; caudal femur, 11.5 mm. Width of pronotum, 2.8; tegmen, .6; cephalic femur, 1.7 mm.

*Allotype*, ♂.—Length of pronotum, 2.8; mesonotum, 8.3; metanotum, including median segment, 10.3; tegmen, 6.7; wing, 37.8; cephalic femur, 11.3; median femur, 8; caudal femur, 12.7 mm. Width of pronotum, 1.8; dorsal field of tegmen, 3.2; cephalic femur, .9 mm.

*Type*, ♀.—General coloration clove brown, except face which is pale, sea-foam green, and cephalic femora suffused, but not solidly, with light brownish olive. Antennae olive brown, mottled with deep olive-buff, this strongest distad and showing traces of pale green meso-distad. Fifth dorsal abdominal segment showing traces of warm buff dorsad, sixth with dorsal surface warm buff heavily maculate with clove brown. The two plates latero-distad of the operculum each with an oval, slightly raised and conspicuous area of warm buff with surface smooth. Due to the contrasting coloration and very different texture from the surrounding surface of the insect, these two areas are very conspicuous. Median limbs mummy brown, marbled with prout's brown; caudal limbs clove brown, marbled with mars brown.

*Allotype*, ♂.—General coloration of head, pronotum and mesonotum buffy brown, suffused, but not solidly, with deep olive-buff. Antennae olive-brown, mottled with deep olive-buff and showing a very faint trace of green meso-distad, proximad several segments are so extensively buffy that in these portions the antennae appear weakly annulate. Tegmina with lateral field olive-buff, with a few irregular marks of deep olive; dorsal field, including shoulders, deep olive mottled with sage green. Wings with anterior field buffy brown, with large irregular patches of olive-buff mesad in portions toward costal margin which are exposed when at rest; posterior field transparent, unicolorous, drab-gray, showing a very feeble iridescence. Limbs buffy brown mottled with buffy, this suffusing the cephalic femora almost solidly in distal half to near the apex.

We would note that the female has the appearance of a brown and feebly lichenose twig, while the male rather resembles mottled and more strongly lichenose bark. In such forms the degree of mottling is, in all probability, decidedly variable individually.

The pair is unique.

#### **Metriotes diocles** Westwood

1859. *Metriotes diocles* Westwood, Cat. Orth. Ins. Brit. Mus., Phasmidae, p. 161, pl. xv, figs. 1, 1a and 1b. [♀, Colombia.]

Honda, Tolíma, 600 feet, III, 1913, (from A. Maria), 1 ♀, [Hebard Cln.].

Length of body, 84; tegmen, 21.8; wing, 60.8; cephalic femur, 18.2; caudal femur, 16.8 mm.

This beautiful member of the Prexaspes Division has been recorded from Chiriqui, Panama; Bogotá, Colombia, and Ecuador.

#### HETERONEMINAE

We here find a series of American genera, part assigned to the Bacunculinae, part to the Phibalosominae by Brunner and Redtenbacher, based on characters which as used are wholly or in part unsatisfactory. The proportionate length of the median segment is by far the most important of these; being decidedly shorter than one-third of the metanotum (*Dyme*, *Calynda*), distinctly shorter than the metanotum (*Bostra*) or longer than the metanotum (*Bacteria*, *Otocrania*). Separation of *Calynda* from *Dyme* is made on the greatly produced operculum in females of that genus; but in females which are assigned to *Bostra*, similar contrasts in this organ are found. Separation of *Otocrania* from *Bacteria* is made by the two very large horns on the head, but again there are species which show this feature in every way similar, but from the proportions of the median segment are referred to *Bostra*. It is probable that the majority or all of these genera are valid and that additional valid genera are represented among the already described species concerned; but we are convinced that the generic assignment of the species is and will be in many cases inaccurate, until the genera involved are carefully studied and other or additional characters determined for their separation. At present far too little material is at hand to attempt this study and we are obliged to follow Brunner and Redtenbacher.

It is indeed deplorable that, with so many species before them, those authors have made virtually no effort to study and discuss these problems in a scholarly and scientific manner. They have treated the forms recorded or described throughout the "Insektenfamilie der Phasmiden" practically without regard for any recent scientific literature, and in a brief, stereotyped and careless manner that would have brought little credit to an author publishing one hundred years earlier. In their work palpably careless inaccuracies in geographic records are frequent, and localities given for many

American species often prove the material to be misidentified or mislabelled. We would be inclined to commend the series of measurements given for each species discussed, but when we consider the lack of care, errors and ignorance of geographic essentials and the host of clearly inadequate descriptions, we naturally fear that the measurements have been compiled in the same manner. As a whole, we can definitely state that the "Insektenfamilie der Phasmiden" is the greatest retrograde step made in recent years, away from true scientific study of the order Orthoptera.

***Bostra*<sup>82</sup> *colombiae*** new species (Plate XXII, fig. 5 and 6.)

This species shows nearest affinity to *B. incompta* Rehn.<sup>83</sup> The differences in the male genitalia are very decided, however; the lateral portions of the eighth dorsal abdominal segment being hardly at all produced ventrad, the operculum not as deep and more evenly and broadly convex distad. The head, pronotum, mesonotum, metanotum and limbs are all slightly but appreciably more elongate and attenuate than in *incompta*, the length of the median segment approaching slightly more closely that of the metanotum.

*Type*.—♂; San Antonio, Cauca, Colombia. Elevation, 6600 feet. December, 1908. [United States National Museum.]

Size large; form very slender and elongate; surface smooth but not glabrous as in *incompta*. Head moderately elongate; eyes circular, length contained twice in cheek; occiput smooth, unarmed. Pronotum nearly twice as long as broad. Median segment only a little shorter than metanotum. Sixth dorsal abdominal segment broadening slightly caudad, distinctly shorter than fifth; seventh with sides parallel, half as long as sixth; eighth slightly shorter than seventh, with sides produced ventrad no lower than seventh, its median portion slightly pinched and more strongly convex, lateral margins almost straight. Ninth (distal) dorsal abdominal segment small, with length equal to width, surface convex except distad where it is weakly bi-impressed, lateral margins

<sup>82</sup> Redtenbacher has described twenty-five new species of *Bostra* in the "Insektenfamilie der Phasmiden," entirely without figures. Though the association of sexes is extremely difficult, conscientious effort to do so on the part of that author would have secured much better results. The overlooking of *B. jugalis* Rehn has resulted in the erection of two synonyms: *amplectens* described from the male, *longeoperculata* from the female. A Costa Rican pair of this species, still in coitu, establishes definitely this sex association.

<sup>83</sup>In the Philadelphia collections are a paratype male and an additional Costa Rican male.

evenly convex, slightly flaring, cingulate to distal margin which is feebly concave, ventral surface of distal margin thickened on each side, transversely sub-bilobate ventrad, with surface heavily armed with minute spines. Cerci slender, elongate, straight to the roundly enlarged apices which are bent inward. Mesosternum and metasternum with a heavy, glabrous, microscopically pitted, medio-longitudinal carina. Seventh ventral abdominal segment over half as long as sixth, enlarging somewhat caudad. Subgenital plate (eighth ventral abdominal segment) of equal diameter throughout and of almost equal depth throughout, ventral length twice depth; proximal portion convex in transverse section, distal portion convex, in outline sharply ascendant, from a very minute, transverse, ventro-mesal node directed caudad, to the free dorsal margin which is moderately thickened and forms part of a narrow oval.<sup>84</sup> Limbs very elongate, strongly carinate and compressed, unarmed. The caudal femora reach to near base of sixth abdominal segment. Metatarsus very elongate, the combined length of the succeeding joints only three-quarters its length.

Length of body, 101; head, 4; pronotum, 3; mesonotum, 28.7; metanotum, including median segment, 17.2; median segment, 8.2; ninth (distal) dorsal abdominal segment, 1.9; poculum, 3.7; cephalic femur, 39.2; median femur, 30.8; caudal femur, 37.7; caudal tibia, 44; caudal metatarsus, 8.7 mm. Width of mesonotum, 1.2; abdomen at poculum (greatest), 2. Depth of poculum, 2 mm.

General coloration brownish olive; limbs darker, particularly toward the genicular regions; the femora and tibiae all broadly tri-annulate with buffy, these annuli suffused; tarsi buffy.

In addition to the type, a paratypic male, bearing the same data but taken in January, 1909, is before us.

A badly preserved female, apparently two or three instars removed from maturity, from the same locality, taken July 25, 1908, is at hand.

This specimen is apparently the same species, the relative proportions all agreeing as closely as would be expected for the sexes. The head has two small conical occipital spines (length, 1.3 mm., more decided and approximate than in Costa Rican females of *B. jugalis* Rehn, at hand) and laterad of these a minute conical spine toward each eye, the occipital surface is smooth, supplied with twelve abrupt, rounded, minute nodes. The mesonotum and metanotum are almost perfectly smooth, showing a few, widely scattered, weakly defined nodules laterad. The otherwise smooth pleura and sterna are supplied with more numerous, but widely

<sup>84</sup> In *incompta* the sides of the eighth dorsal abdominal segment are more projecting, wider, though not produced, the seventh ventral segment widens more strongly and the broader subgenital plate is more decidedly deflexed, these features making the distal portion of the abdomen of that species much heavier and more strongly clubbed.

scattered, similar nodules. The limbs are unspecialized, the caudal metatarsi simple, equalling the combined length of the succeeding joints. The ninth (distal) dorsal abdominal segment is slightly longer than broad, truncate at apex. The sixth ventral abdominal segment is produced in a small rounded mesal projection at the base of the operculum. The operculum is broken.

**Bacteria**<sup>85</sup> **apolinari** new species (Plate XIX, figs. 10 and 11.)

The species appears to be nearest *B. horni* Redtenbacher. It agrees in being apterous, with vertex smooth, eighth dorsal abdominal segment with lateral margins straight and horizontal, median segment not more than half again as long as the metanotum, femora not bearing lobes and ninth (distal) abdominal segment with apex rounded, not bilobate. In addition to having longer limbs and mesonotum, but metanotum and median segment of approximately the same length, the genitalia show the present insect to be distinct. Were the description of *horni* adequate, other differential characters could doubtless be given.

*Type*.—♂; Susumuco, Cundinamarca, Colombia. Elevation, 2600 feet. August, 1913. (From A. Maria.) [Hebard Collection, Type No. 456.]

Size medium for the genus, form slender. Head ovate, weakly narrowed caudad, cheeks about two and one-half times as long as eye. Pronotum, mesonotum and metanotum smooth, the former with the median transverse sulcus weakly indicated. Abdominal segments elongate, slightly enlarged at their junctures; seventh dorsal segment three-fifths as long as sixth, widening moderately and evenly caudad; eighth about three-quarters as long as seventh, proximad impressed dorso-laterad, not narrowing caudad, lateral margins briefly convex proximad, thence straight, horizontal, the latero-caudal portions of the segment vertical with angle sharply rectangulate; ninth (ultimate) segment intermediate in length between seventh and eighth segments, narrow in distal half, strongly cucullato-tectate, with an appreciable blunt medio-longitudinal carina and lateral surfaces regularly convex, lateral margins concave to cercal bases, there forming a blunt obtuse-angulate production, thence to bluntly rounded apex feebly concave, their ventral surfaces thickened, particularly distad, heavily supplied with stout, recurved denticulations. Seventh ventral abdominal segment strongly widened caudad. Subgenital plate (eighth ventral abdominal segment) strongly inflated, with a small blunt conical projection (rounded-triangular in lateral outline) slightly caudad of the median point, from which a minute medio-longitudinal carina extends to the evenly convex free dorsal margin. Cerci elongate, cylindrical, very feebly incurved, enlarging

<sup>85</sup> Thirty-seven new species of this genus are described by Redtenbacher in the "Insektenfamilie der Phasmiden." No figures are given for these, the treatment being fully as unsatisfactory as that of the species of *Bostra*.

very feebly to the bluntly rounded apices. Limbs simple, cephalic flexure of cephalic femora brief and very decided. Median femora with median carina of ventral surface well supplied with minute chaetiform hairs.<sup>86</sup> Metatarsi simple.

Length of body, about 100; head, 4.1; pronotum, 3.2; mesonotum, 24.4; metanotum, including median segment, 15.7; median segment, 9.9; first dorsal abdominal segment, 7.3; cephalic femur, 31.3; median femur, 25; cephalic tibia, 36.6. Width of head at pronotum (least), 2.2; mesonotum (least), 1.8; abdomen at intersection of seventh and eighth segments, 2.9 mm.

General coloration sepia. Head with dorsal surface tawny olive, paler laterad, with a postocular band of blackish brown on each side, below which the genae are buffy. Abdomen much paler distad, buffy with a few very small markings of black on seventh and eighth and proximal portion of ninth dorsal segments. Subgenital plate dark brown proximad and distad, shading to paler mesad and with a transverse black spot at the caudal base of the median projection.

The type is unique.

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We have considered Brunner's treatment of his sub-family Bacunculinae, in the "Insektenfamilie der Phasmiden," with surprise and dismay. It did not seem possible that so pretentious a work, published as recently as 1906 to 1908, by supposedly the greatest of orthopterists living at that time, could actually be so carelessly executed, superficial and unsatisfactory.<sup>87</sup> Inexcusable ignorance of important literature is shown, publications antedating that work by as much as ten years being wholly or in part ignored. The most important recent literature by Kirby, Rehn and Giglio-Tos has received such treatment. As an instance: of the fourteen Ecuadorean species of the Phasmidae described by Giglio-Tos in 1898, three are mentioned. Kirby's Catalogue, including fixation of all the genotypes, published in 1904, is completely ignored. Selection of single types or genotypes is in almost all cases apparently deemed superfluous.

The new genus *Ocnophila*, placed among the first genera of the Bacunculinae, is made to include twenty-nine species, many of which when carefully studied will certainly be found to represent distinct generic units. The twenty-five new species are described

<sup>86</sup> The caudal limbs are missing.

<sup>87</sup> Brunner states that the species of *Libethra* can be separated from those of allied genera only by genitalic features. He describes *Libethra brevipes* from a single female, lacking head and distal portion of abdomen, labelled "Mexico." This kind of work speaks for itself. We would note, however, that the genus *Libethra* is apparently confined in distribution to northwestern South America.

in the usual superficial manner, but sufficient characters are given to show that the majority, to varying degrees, violate even the very brief and unsatisfactory generic description. No genotype was selected. We here select as genotype, *Ocnophila integra* Brunner, the only species of which figures were given.

#### LIBETHRA Stål

1875. *Caulonia* Stål, Recens. Orth., iii, p. 74.

1875. *Libethra* Stål, ibid., iii, p. 74.

Kirby's genotypic designation for *Caulonia* Stål<sup>88</sup> is invalid, being based on a species not originally included in that genus by Stål. We here select *Ceroys rabdota* Westwood as genotype of *Caulonia* Stål.

Brunner's designation of a genotype for *Libethra* is invalid,<sup>89</sup> being antedated by Kirby's designation of *Libethra nisseri* Stål.<sup>90</sup>

It is almost certain that *rabdota* and *nisseri* are congeneric, and in consequence *Libethra* would fall as a synonym of *Caulonia*, the latter description having line priority,<sup>91</sup> except for the fact that *Caulonia* is preoccupied, Lorient, in 1873, having used this name for a genus of Echinoderms.

Study of the literature and the material now at hand convinces us that a host of species of the genus occur in Colombia. The variously specialized forms are easily separated, association of the sexes alone proving difficult for some in which the males almost or altogether lack the most distinctive features exhibited by the females.

The least specialized forms are, however, difficult in the extreme, at least in the state of our present knowledge. From the series at hand it is clear that in the same species both green and brown color forms occur, and that, in the brown condition, the body granulation and carinulae of the dorsal abdominal segment may be intensified. Size variation is also apparent and the similarity of nearly adult to fully adult material makes careful examination of each individual essential. Large collections, containing extensive series of each species, will have to be assembled before the number of such species and the association of the sexes can be definitely and conclusively determined. In the material

<sup>88</sup> Syn. Cat. Orth, i, p. 344, (1904).

<sup>89</sup> Insektenfamilie der Phasmiden, p. 304, (1908).

<sup>90</sup> Syn. Cat. Orth., i, p. 345, (1904).

<sup>91</sup> Brunner uses *Libethra*, discarding *Caulonia* without explanation.



at hand but one species of the plain forms, *L. strigiventris* (Westwood), is so represented.

We would note that *Libethra aurita* Rehn, which species Brunner has ignored, describing the synonymous *Libethra confusa*, is referable to the genus *Sermyle*. Kirby has selected as genotype of *Sermyle*, *Acanthoderus mexicanus* Saussure, which species Brunner later places in his genus *Ocnophila*. Were the species there included congeneric, this would invalidate *Ocnophila*.

***Libethra spinicollis*** new species (Plate XXIII, figs. 1 and 2.)

This stout and highly specialized species is nearest *L. rabdota* (Westwood), differing strikingly in being decidedly shorter, the head with numerous smaller, irregular, blunted spines caudad of the pair of thickened composite spines (in this feature alone agreeing rather with *L. bifolia* (Stål)), the pronotum with paired clusters of heavy, blunted, composite spines caudad (not occurring in any other known species of the genus), the mesonotum with a similar pair of fused clusters of smaller, blunted, composite spines caudad, the first dorsal abdominal segment with four nodes at the caudal margin, the second with a large depressed lobe (as in *rabdota*), the third with medio-longitudinal carinae terminating in a very small lobe, the sixth with medio-longitudinal carinae developing into a small depressed lobe.

*Type*.—♀; San Antonio, Cauca, Colombia. Elevation, 6600 feet. October, 1908. [United States National Museum.]

Size medium for genus, form robust. Head with occiput armed with a pair of sublamellate, thickened, composite spines, caudad of which are numerous smaller, irregular, blunted spines, which decrease in length caudad, cephalad and laterad of which are still smaller blunted spines and nodes. Antennae simple, slender, extending to near caudal margin of metanotum. Pronotum with surface rugulose and nodulose, broadly subsulcate mesad and proximad on each side, with paired clusters of heavy, blunted, composite spines caudad; width greater caudad, nearly equal to length. Mesonotum rugulose and nodulose, moderately tectate, with an irregularly placed longitudinal row of short stout spines (three to four) on each side, and near the caudal margin armed with a pair of fused clusters of short, stout, blunted, composite spines. Mesopleura armed with an irregularly placed longitudinal row of short stout spines (five and six). Metanotum nodulose, with a few short, stout, blunt spines proximad; minute elongate rugulose pads above the trochanters of the median limbs suggest vestigial wings. Metapleura armed with a longitudinal row of short, stout spines (four and four). Median segment rugulose. Dorsal abdominal segments nodulose, irregularly multicarinulate; first with four small, blunt, conical projections at caudal margin, of which the median pair are deflexed caudad; second with a large, transverse, horizontally extended lobe caudad,

which overhangs the proximal half of the third segment, this lobe with margins angulato-arcuate, its dorsal surface irregularly rugulose with projections similar to those of third segment mesad at its base; third with median carinae enlarged caudad into very small, vertical, rounded plates directed caudad; fourth, fifth, seventh and eighth segments with median carinae terminating caudad in small projecting nodes directed caudad; sixth with a pair of rounded plates meso-caudad, fully twice as large as those of the third segment, on each side of which is a small plate of half the size; ninth (distal) segment with a weak medio-longitudinal carina, lateral margins convex-convergent to the minutely angulate-emarginate apex. Ventral surface strongly nodulose. Operculum very elongate, extending to apex of abdomen,<sup>92</sup> carinate medio-longitudinally, deeply rotundato-emarginate at the narrow apex, the lateral projections narrow and bluntly rounded distad. Cephalic femora weakly laminate, carinae very decided, dorsal surface with (six and seven) weak strumositities, these making the dorso-lateral carinae weakly crenate. Cephalic tibiae with dorso-lateral carinae weakly crenate, the more proximal of these sub-lobate. Median femora with dorso-lateral carinae each supplied with three opposed lobes, these increasing in size distad, those of the dorso-caudal margin decidedly the largest. Median and caudal tibiae with dorso-lateral carinae each supplied with three small opposed lobules. Caudal femora with lobes as in median femora, but with a faintly indicated additional pair of sub-lobate expansion distad. Well-developed arolia present.

Length of body, 48; composite spines on head, 1.3; pronotum, 3.2; composite spines on pronotum, 1.3; mesonotum, 10.8; metanotum, including median segment, 6.8; lobe of second dorsal abdominal segment, 2.1; cephalic femur, 11.5; median femur, 8.8; caudal femur, 11.2; operculum, 8.8 mm. Width of pronotum, caudad, 3.8; mesonotum, caudad, 4.7; lobe of second dorsal abdominal segment, 5; cephalic femur at widest point, 1.7 mm.

General coloration mummy brown. Labrum ochraceous-tawny. Mesosternum and metasternum mars brown, maculate with mummy brown.

In addition to the type a single immature female, 41.5 mm. in length, is at hand, bearing the same data but taken in December.

***Libethra columbina*** (Westwood)

1859. *Ceroys columbina* Westwood, Cat. Orth. Ins. Brit. Mus., Phasmidae, p. 62, pl. xxiv, figs. 1 and 1a. [♀, Colombia.]

San Antonio, Cauca, 6600 feet, XI, 1908, 1 ♀, [U. S. N. M.].

This insect, compared with *L. spinicollis* here described, agrees in size and similar, though much less decided, specialization of

<sup>92</sup> The operculum is elongate, slender and tapering from the median portion, which is distinctly strumose, to the narrow apex, which is emarginate, in all the females of *Libethra* at hand. It completely hides both the ovipositor valves and the very brief cerci. This is in our opinion of high generic value, minor differences in type of apex alone appearing to have specific significance.

the limbs. The form is robust, but not as stout as in that insect. There are no lobes or spines, except that the sixth dorsal abdominal segment has the median carinulae terminating caudad in a very small sub-lobate projection. Westwood's figure is excellent, showing accurately the arcuation and greater distinctness of the medio-lateral carinulae on the dorsal surface of the abdomen.

***Libethra insalubris***<sup>93</sup> new species (Plate XXIII, fig. 3.)

Apparently closely related to *L. rabdotula* Brunner, differing in the irregular occipital excrescence, unarmed metanotum and unspecialized fourth and fifth dorsal abdominal segments. The species is much more slender than *L. rabdota* (Westwood), with which species Brunner compares *rabdotula* but makes no comment on this feature in his inadequate description.

*Type*.—♀; Pueblo Nuevo de Ocaña, Santander, Colombia. September 3, 1916. (M. A. Carriker Jr.) [Hebard Collection, Type No. 469.]

Size medium; form slender for genus, as slender as in the unspecialized species before us, *L. strigiventris* (Westwood) and *L. molita* (Westwood). Head with surface of occiput smooth, but well supplied with nodules and a few blunt spines, and mesad with a large, trilobate, very irregularly nodose, paired excrescence.<sup>94</sup> Eye small, length contained four times in that of cheek. Antennae simple, slender, extending to base of second abdominal segment. Pronotum with length nearly twice caudal width, transverse and longitudinal sulcus weakly indicated, the latter briefly replaced by a delicate carinula caudad, surface smooth but thickly supplied with nodules and small nodes. Mesonotum elongate and slender, with a delicate medio-longitudinal carinula, surface smooth but thickly supplied with nodules and small nodes. Metanotum and median segment with a delicate medio-longitudinal carinula, the surface subrugulose but weakly supplied with nodules and very few small nodes. Dorsal abdominal segments multicarinulate and nodulose. First dorsal abdominal segment with entire dorsal surface caudad developed into a trilobate, equally produced, horizontally extended, foliaceous plate,<sup>95</sup> the lateral lobes acute-angulate, the median lobe much broader with caudal margin irregularly and broadly convex; from the bases of the lateral lobes, delicate, bluntly subserrate, parallel carinulae extend to the cephalic margin of the segment. Second dorsal abdominal segment with caudal portion developed

<sup>93</sup> In allusion to the unwholesome appearance of the irregularly trilobate excrescence on the occiput.

<sup>94</sup> This excrescence is strongly asymmetrical, the sinistral lobe has a supplementary lobe projecting latero-cephalad near its juncture with the dextral lobe. It is to be expected that additional material will show individual variation in so asymmetrical a structure.

<sup>95</sup> The dextral lobe of this plate is wider, with margins more convex, than the sinistral.

into a much larger, transverse, horizontally extended, foliaceous plate, the broad caudal margin of which is irregularly convex with a distinct bilobation indicated mesad; four carinulae, such as the two shown on the first segment, occur. Third dorsal abdominal segment with a very much smaller, horizontally extended, foliaceous plate; sixth with a similar but slightly larger plate and with two parallel dorsal carinae; other dorsal abdominal segments unarmed. Ninth (distal) dorsal abdominal segment with a medio-longitudinal carina and two lateral carinulae concave-divergent caudad, lateral margins caudad broadly convex-convergent to the minutely angulate-emarginate apex. Ventral surface rugulose, nodulose and moderately supplied with nodes. Operculum much as in *L. spinicollis* here described, but with apex only moderately rotundato-emarginate. Cephalic femora weakly laminate, carinae very decided, dorso-lateral carinae of these portions and also the dorso-internal carina of the cephalic tibiae feebly undulate, dorso-external carina of cephalic tibiae supplied with (two and three) very minute and widely spaced lobes. Median and caudal femora with a moderately large, bilobate production of dorsal carinae proximad and two similar, smaller bilobate productions distad, the lobes of the caudal carinae being the more decided. Median and caudal tibiae with dorsal carinae supplied with (two external and one internal) very minute lobes, these no more decided than those of the cephalic tibiae. Well-developed arolia present between the delicate tarsal claws.

Length of body, 49.5; excrescence of occiput, 1.6; pronotum, 2.8; mesonotum, 12.2; metanotum, including median segment, 7.6; lobe of first abdominal segment, 1.1; lobe of second segment, 2.4; lobe of seventh segment, 1.2; cephalic femur, 13.1; median femur, 10; caudal femur, 12.8; operculum, 7.7 mm. Width of pronotum, caudad, 2.1; mesonotum, caudad, 2.9; lobe of first abdominal segment, 3.1; lobe of second segment, 5; lobe of seventh segment, 1.1; cephalic femur at widest point, 1.2 mm.

General coloration light ochraceous-buff, feebly maculate and speckled with bone brown, with a suffusion of this color over the proximal and meso-distal portions of the abdomen (possibly due to discoloration). Occipital excrescence blackish, contrasting strongly with the head coloration which is ochraceous-buff, with a suffused postocular band of bone brown on each side. Lobes on abdomen and limbs bone brown. Ventral surface of body and limbs light ochraceous-buff, heavily suffused with bone brown.

The type is unique.

***Libethra strigiventris*** (Westwood) (Plate XXIII, figs. 4, 5 and 6.)

1859. *Bacteria strigiventris* Westwood, Cat. Orth. Ins. Brit. Mus., Phasmidae, p. 28, pl. xxiv, figs. 6, 6a and 6b. [♀, Colombia.]

Cauca, 1 ♀, [A. N. S. P.].

San Antonio, Cauca, 6600 feet, I, IV, VI, VII, VIII, X, XI, XII, 1908, 8 ♂, 3 ♀, 1 juv. ♂, [U. S. N. M.].

Tocota, Cauca, 6500 feet, V, 28, 1908, 1 ♀, [U. S. N. M.].

Rio Aguatal, Cauca, 4600 to 5900 feet, VI, 15 and X, 1908, 2 ♀, [U. S. N. M.].

The series enables us to associate the sexes with little difficulty. In length little difference between these occurs.

The males are readily distinguished from those of *L. molita* (Westwood) by the average decidedly smaller size, much shorter antennae, which extend only to base of abdomen, more inflated disto-dorsal abdominal segment, which is strongly transverse, absence of acute-angulate projection of latero-caudal angle of preceding segment (shown by males of that species at hand and excellently figured by Westwood for the type) and more roughly nodose ventro-caudal surface of subgenital plate.

The females differ from those of *molita* in average decidedly smaller size, with antennae shorter, extending only to base of abdomen, and in being somewhat less attenuate, the multicarinate condition of the dorsal surface of the abdomen more pronounced and the pronotum and mesonotum being heavily acute-nodulose to varying degrees in all but pale examples, in some of which these portions are fully as smooth as in *molita*.

The present series shows conclusively the development of both green (yellowish in dried material) and brown color phases in the female sex and that, in the green condition, the pronotum, mesonotum and metanotum become much smoother.

Measurements (in millimeters)					
♂	Length of body	Length of mesonotum	Width of mesonotum	Length of metanotum	Length of cephalic femur
San Antonio (8) <sup>96</sup> ..	42-55.5	12-16.2	1.7-1.8	8.4-9.8	13-17
♀					
San Antonio (3) ..	46-48	11.2-11.8	2.9-2.6	8	12.4-13.2
Tocota .....	46	11	2.8	7.9	11.8
Rio Aguatal (2) ..	46-46.5	12-11.8	2.7-2.6	8-8.2	13

In addition to the series recorded there is a male from San Antonio, taken in October, agreeing in every genital feature and with the majority in size. In this specimen, however, the occiput bears three minute blunt denticulations latero-dorsad on each side, while in addition to minute twin dark maculations meso-caudad on each dorsal abdominal segment, the second segment bears twin minute blunt denticulations at this point. The importance of these features can not be determined and if the specimen is referable to a different species we are at present unable to place it.

<sup>96</sup> All but two of the males at hand are very close to the minimum measurement.

***Libethra molita*** (Westwood)

1859. *Bacteria molita* Westwood, Cat. Orth. Ins. Brit. Mus., Phasmidae, p. 29, pl. xxiv, figs. 3, 3a and 3b. [♂, Colombia.]

Cunday, Tolima, 1550 feet, X, 1916, (from A. Maria), 1 ♀, [Hebard Cln.].

Villa Eloira, Cauca, 5900 feet, X, 6, 1908, 1 ♀, [U. S. N. M.].

San Antonio, Cauca, 5900 and 6600 feet, X, 1908 and I, 1909, 2 ♂, [U. S. N. M.].

The males agree fully with Westwood's excellent description and figures except that one is decidedly larger, the other very much larger, than the type. In addition to the diagnostic features discussed under *L. strigiventris* (Westwood) for both sexes, we would note that in these males the antennae extend to the apex of the abdomen, the dark general coloration is more unicolorous and greenish, and the brief proximal pale portions of the femora more decided, than in any of the males of that species at hand.

The females have the antennae extending as far as the base of the fourth abdominal segment. The two at hand were green in life. Both agree closely in all features except proportionate length of cephalic femora and mesonotum<sup>97</sup> and are apparently very small examples. The female recorded and measured by Brunner, though decidedly larger than these examples, would not be of proportionately large size to the larger male at hand. From these few specimens it would appear certain that the species shows tremendous individual size variation.

*Measurements (in millimeters)*

♂	Length of body	Length of mesonotum	Width of mesonotum	Length of metanotum	Length of cephalic femur
San Antonio (2) . .	73-82	22.5-24.2	1.7	13.8-15	21.5-24.6
♀					
Villa Eloira . . . . .	59	13.7	2.7	9.6	15.3
Cunday . . . . .	61.5	16	2.9	10.4	15.8

A single male from Pueblo Nuevo de Ocaña, Santander, taken September 3, 1916, by M. A. Carriker Jr., is at hand. This specimen agrees fully with the males of *molita* in coloration and all diagnostic features, except that there are a few minute nodules on the otherwise smooth occiput, and, as in *L. strigiventris*, the latero-caudal angles of the penultimate dorsal abdominal segment

<sup>97</sup> It would appear that this character as used by Brunner is of no value. It is probable that his *L. socia* is a synonym of this species, or of *L. strigiventris*.

lack an acute-angulate projection, as found in *molita*. The significance of these features can not at present be determined, though probably indicating specific distinction.

**LIBETHROIDEA** new genus

Related to *Libethra* and *Ocnophila*, differing from the former only, but strikingly, in the distal abdominal segments of the female, in which sex the ninth (ultimate) segment is produced, elongate, extending far beyond apex of abdomen, with apex rounded.

*Genotype*.—*Libethroidea inusitata* new species.

We would place Giglio-Tos' *Bacunculus sarmentum* and *palea* in this genus; the differences in the operculum of these species are unusual for congeneric forms and when both sexes of these species are known, further generic separation may be found necessary.

*Generic Description*.—Four caudal tibiae lacking an impressed ventral triangular area distad. Median segment very much shorter than metanotum, strongly transverse. Ocelli absent. Tegmina and wings absent. Head elongate. Antennae elongate. Abdomen of female longitudinally carinulate. Ninth (distal) dorsal abdominal segment of female very elongate, lanceolate, decidedly longer than any other dorsal abdominal segment and extending much beyond apex of abdomen. Operculum of female very elongate, concealing ovipositor valves and cerci, as in *Libethra*, rounded distad with apex briefly cleft, the lateral portions of the apex broad. Cephalic femora strongly compressed.

***Libethroidea inusitata*** new species (Plate XXIII, figs. 7 and 8.)

Apparently closely related to *L. palea* (Giglio-Tos), differing in having the apex of the operculum cleft and in coloration, which is not immaculate in that species. The size is also smaller. Comparison of material of these species would probably show other differences.

*Type*.—♀; Altas de las Cruces, near San Antonio, Cauca, Colombia. Elevation, 7200 feet. October, 1908. [United States National Museum.]

Size medium, form moderately slender as compared with the species of *Libethra*. Antennae simple, elongate, reaching to near median portion of abdomen. Head elongate; occiput smooth, except for (three and four) minute nodes arranged longitudinally near the caudal margin back of the eyes. Eye small, length contained four times in cheek. Pronotum decidedly shorter than

dorsal surface of head, lateral margins parallel, surface smooth, transverse and longitudinal sulcus subobsolete, a few nodules weakly defined laterad. Mesonotum with surface smooth, furnished cephalad and meso-laterad with moderately numerous small nodes. Metanotum with surface smooth, furnished laterad with a few small nodes. Median segment smooth. Dorsal abdominal segments longitudinally multicarinulate, the first two with a very few small nodes laterad. Seventh dorsal abdominal segment nearly twice as long as eighth, which is subquadrate. Ninth (ultimate)<sup>98</sup> dorsal abdominal segment very elongate, nearly as long as combined length of seventh and eighth segments, surface smooth with a medio-longitudinal carina, form lanceolate, with apex sharply rounded. Ventral surface of insect smooth, without carinulae or nodules. Operculum very elongate, rounding rather sharply distad with apex briefly fissate, not extending beyond apex of abdomen. Limbs simple, unarmed. Cephalic femora strongly laminate. Tarsal joints very elongate, metatarsus equal to combined length of succeeding three joints, ventral surfaces heavily supplied with very delicate hairs, apices of four proximal joints occupied by moderate pulvilli. Moderate arolia present between the delicate tarsal claws.

Length of body, 60; head, 4.7; dorsal surface of head, 4.3; pronotum, 3; mesonotum, 13.7; metanotum, including median segment, 9.3; sixth dorsal abdominal segment, 3; seventh, 3.8; eighth, 1.9; ninth (ultimate), 5.3; operculum, 7.9; cephalic femur, 17.3; cephalic tibia, 18.3; median femur, 12; caudal femur, 15.2; caudal tibia, 16.8; caudal metatarsus, 2.8 mm. Width of head, behind eyes, 2.9; pronotum, 2.6; abdomen, at widest point, 3.3; cephalic femur, at widest point, 1.7 mm.

Coloration immaculate, pale green, faded to yellowish on median portion of body. In life probably light bice green, as are the cephalic limbs in this dried specimen.

The type of this species is unique.

#### **LITOSERMYLE** new genus

Relationship with *Sermyle* is evident. Compared with the female of the genotype, *Sermyle mexicana* (Saussure),<sup>99</sup> the female here described differs in the elongate, not globose, head; pronotum with transverse sulcus inconspicuous; ninth dorsal abdominal segment elongate, not quadrate; sixth ventral abdominal segment unspecialized; operculum elongate and ventral surface of subequal width to its truncate apex; proximal portion of ovipositor valves similarly fused and not concealed, but not broad and conspicuously convex, and cephalic femora much more strongly lamellate.

<sup>98</sup> A supra-anal plate is not developed.

<sup>99</sup> A Mexican female in the Hebard Collection is before us.



The genotype of *Ocnophila* having been established as *integra* Brunner, in the present paper,<sup>100</sup> we would note that probably the best linear arrangement of this group of genera is as follows: *Libethra*, *Libethroidea*, *Ocnophila*, *Litosermyle* and *Sermyle*.

The present female would appear to differ from that sex of *Ocnophila integra* Brunner, genotype, in the more elongate head; elongate, not quadrate, ninth (ultimate) dorsal abdominal segment, and elongate operculum, with ventral surface of equal width to the truncate apex, not sublanceolate.

*Genotype*.—*Litosermyle ocanae* new species.

*Generic Description*.—All diagnostic characters, except the following, as given on page 170 for *Libethroidea*.<sup>101</sup> Ninth (distal) dorsal abdominal segment of female<sup>102</sup> elongate, not narrowing, truncate distad. Operculum of female with width of ventral surface subequal to that of its truncate apex, very elongate but leaving the ovipositor valves exposed. Cerci of female exposed from below. Genicular lobes of median and caudal femora acute produced, more so than in any species at hand of *Libethra* or *Libethroidea*, not as much produced but more acute than in the species of *Sermyle* before us.

***Litosermyle ocanae*** new species (Plate XXIII, figs. 9 and 10.)

This somber and plain walking stick exhibits a type of female genitalia widely different from that of any previously described form. In Brunner's key for *Ocnophila* the species would run to the genotype, *integra* Brunner, the differences discussed above obliging us to separate *ocanae* as generically distinct.

*Type*.—♀; Pueblo Nuevo de Ocaña, Santander, Colombia. September 3, 1916. (M. A. Carriker Jr.) [Hebard Collection, Type No. 470.]

Size medium; form moderately slender as compared with species of *Libethra*, medium as compared with species of *Sermyle*. Antennae simple, moderately elongate, reaching to base of third dorsal abdominal segment. Head elongate, occiput smooth but with six longitudinal rows of minute, blunt, irregularly

<sup>100</sup> See page 163.

<sup>101</sup> The species of the group of allied genera of the Heteroneminae, to which this genus belongs, show almost exclusively the characters of generic value in the distal abdominal segments and genitalia. This is in part due to the fact that differences in length of antennae, and simple or variously specialized processes or armament of body segments and limbs, constitute most striking features to distinguish the species, but are plainly valueless for generic criteria.

<sup>102</sup> The male sex is unknown.

spaced, microscopic tubercles. Eye small, oval, length contained six times in cheek. Pronotum decidedly shorter than dorsal surface of head, lateral margins parallel, transverse and longitudinal sulcus weakly defined, surface rather thickly supplied with minute nodules and subtuberculate. Mesonotum with surface thickly supplied with minute nodules, subtuberculate and feebly carinulate, showing a faint medio-longitudinal carina. Metanotum similar with a very faint lateral carinula on each side caudad, these continued on median segment, the surface of which is similar. Mesopleura and metapleura nodose. Dorsal abdominal segments longitudinally multicarinulate, the four median carinulae increasing slightly in strength toward the caudal margin of each segment, this more marked on the second and sixth segments, slightly less decided on third, on these three segments forming minute rounded crests at the caudal margin. Eighth dorsal abdominal segment quadrate. Ninth (distal) dorsal abdominal segment nearly twice as long as broad, moderately convex in transverse section with sides strongly convex; lateral margins parallel, suddenly ascendant distad to the transverse caudal margin, which is minutely emarginate mesad and as a result sub-bilobate; dorsal surface with a median carinula which divides into two small carinulae proximad, laterad on each side with a supplementary carinula, these are slightly convergent in proximal half, thence straight, divergent to point where they round into the distal margin. Mesosternum very feebly and irregularly carinulate and feebly nodulose; metasternum similar but more nearly smooth. Three proximal ventral abdominal segments smooth, succeeding three segments longitudinally multicarinulate. Operculum elongate; ventral surface sharply defined from vertical sides by a decided carina on each side, these carinae parallel but disappearing near apex of plate; ventral surface with a weak medio-longitudinal percurrent carinula, this surface feebly convex proximad, showing a weak swelling mesad, deplanate distad; free margins of sides distad declivent, feebly convex, to abruptly transverse caudal margin, which is concave on each side, thus leaving a brief triangular projection mesad hardly produced beyond the latero-caudal angles. Limbs simple, unarmed, the carinae very decided even on dorsal surfaces of tarsal joints. Cephalic femora strongly laminate, cephalic flexure decided. Tarsal joints moderately elongate, metatarsus slightly longer than combined length of three succeeding joints, ventral surface heavily supplied with delicate hairs, apices of four proximal joints occupied by moderately large pulvilli. Large arolia present between the delicate tarsal claws.

Length of body, 54; head, 4.5; dorsal surface of head, 3.7; pronotum, 2.8; mesonotum, 13; metanotum, including median segment, 9; sixth dorsal abdominal segment, 3.3; seventh, 2.3; eighth, 1.8; ninth (distal), 2.6; operculum, 5.2; cephalic femur, 15.1; cephalic tibia, 16.6; median femur, 10.2; caudal femur, 13.1; caudal metatarsus, 1.8 mm. Width of head, behind eyes, 2.6; pronotum, 2.3; abdomen, at widest point, 2.8; cephalic femur, at widest point, 1.7 mm.

Coloration generally blackish brown, except in the following portions. Face and proximal antennal joint buffy. Head in the ocellar area suffused with

cinnamon and with a postocular band and one parallel on the genae, on each side, of the same color. Limbs blackish brown, showing irregular traces of verona brown.

The type is unique.

**Dyme**<sup>103</sup> **carrikeri** new species

This insect appears to be nearest *D. chiriquensis* Brunner. It agrees in being slender, with limbs very slender, head and thorax smooth, femora unarmed, apex of abdomen more slender with segments not carinate, ventral margins of eighth<sup>104</sup> dorsal segment straight and cerci terete with apices incurved. It differs in having the operculum reaching as far as the apex of the eighth dorsal abdominal segment, in the apparently more strongly fornicate ninth (distal) dorsal abdominal segment,<sup>105</sup> in the shorter mesonotum and metanotum and decidedly shorter femora. Other features doubtless exist, but can not be determined from the inadequate description of *chiriquensis*.

*Type*.—♂; San Lorenzo, Sierra Nevada de Santa Marta, Magdalena, Colombia. Elevation, 8300 feet. August 23, 1913. (M. A. Carriker Jr.) [Hebard Collection, Type No. 455.]

Size medium for the genus; form very slender; surface smooth, moderately glabrous. Head elongate, very slender, cylindrical, moderately depressed and tapering gently caudad from eyes to pronotum. Eye one-third as long as cheek. Pronotum slender, over twice as long as greatest width, showing faintly the transverse and longitudinal sulci. Mesonotum shorter than cephalic femur. Metanotum with suture of median segment obsolete. Median segment very elongate for genus, two-fifths the total length of the metanotum. Abdominal segments elongate and slender, distinctly enlarged at their junctures; seventh decidedly shorter than sixth, widening moderately and evenly caudad; eighth as long as seventh, narrowing caudad, this almost entirely confined to mesal third, lateral outline convex, then very weakly concave, lateral margins briefly convex proximad, thence straight, horizontal, the latero-caudal portion curved briefly inward with angle sharply rectangulate. Ninth (ultimate) dorsal abdominal segment appreciably shorter than eighth, narrow, nearly twice as long as broad, cucullate, smooth, not carinate, lateral margins almost straight, feebly convex, ascendant to apical portion which is feebly notched mesad, the small bilobate portion thus formed with ventral surface of each lobe heavily armed with minute conical teeth. Seventh ventral abdominal segment widening moderately and evenly caudad. Subgenital plate (eighth segment) moder-

<sup>103</sup> Forty new species of this genus are described by Brunner in the "Insektenfamilie der Phasmiden." No figures are given and the insufficient and carelessly drawn descriptions are soon found to be even more unsatisfactory than those of Redtenbacher.

<sup>104</sup> Brunner gives ninth, treating the median as the first abdominal segment.

<sup>105</sup> Termed anal segment by Brunner.

ately inflated, convex, with a median node, lateral margins convex-convergent distad at less than ninety degrees to the rather acute apex, which is opposite the apex of the eighth dorsal abdominal segment. Cerci small, cylindrical from the moderately enlarged bases, with bluntly rounded apex incurved.

Length of body, 78.5; head, 3.2; pronotum, 2.8; mesonotum, 19.1; metanotum, including median segment, 13; median segment, 4.9; first dorsal abdominal segment, 6.2; cephalic femur, 23.1; cephalic tibia, 26.6; median femur, 17.7; caudal femur, 22.8 mm. Width of head, at pronotum (least), 1.9; mesonotum (least), 1.2; abdomen at sixth dorsal segment, 1.2; abdomen at intersection of seventh and eighth dorsal segments, 2.1 mm.

General coloration dull tawny-olive. Head with dorsal surface sepia, face and lower portions of genae buffy. Femora and tibiae marked with scattered minute flecks of black, the median and caudal femora with two obscure, broad bands of buffy weakly indicated, the tibiae tinged with grayish.

The type of this slender phasmid is unique.

TRANS. AM. ENT. SOC., XLV.

## EXPLANATION OF PLATES

## Plate XVI

- Fig. 1.—*Psalis apolinari* new species. Dorsal outline of female. Pamplona, Santander, Colombia. *Type*. ( $\times 3$ )
- Fig. 2.—*Psalis compacta* new species. Dorsal outline of male. Soacha, Cundinamarca, Colombia. *Type*. ( $\times 3$ )
- Fig. 3.—*Psalis compacta* new species. Dorsal outline of apex of female abdomen and forceps. Soacha, Cundinamarca, Colombia. *Allotype*. ( $\times 3$ )
- Fig. 4.—*Neocosmiella atrata* new genus and species. Dorsal outline of male. Pamplona, Santander, Colombia. *Type*. ( $\times 3$ )
- Fig. 5.—*Ischnoptera pallipes* (Scudder). Lateral view of apex of male abdomen. Napo or Mara  n, Upper Amazon. *Type*. ( $\times 16.5$ )  
a.—Remarkably specialized dextral style.
- Fig. 6.—*Ischnoptera apolinari* new species. Dorsal outline of male supra-anal plate. Choachi, Cundinamarca, Colombia. *Type*. (Greatly magnified.)
- Fig. 7.—*Ischnoptera apolinari* new species. Ventral outline of male subgenital plate. Choachi, Cundinamarca, Colombia. *Type*. (Greatly magnified.)
- Fig. 8.—*Ischnoptera colombiae* new species. Dorsal outline of male. Valle de las Pappas to San Augustin, Tolima, Colombia. *Type*. (Natural size.)
- Fig. 9.—*Ischnoptera colombiae* new species. Dorsal outline of male supra-anal plate. Valle de las Pappas to San Augustin, Tolima, Colombia. *Type*. (Greatly magnified.)
- Fig. 10.—*Ischnoptera colombiae* new species. Ventral view of male subgenital plate. Valle de las Pappas to San Augustin, Tolima, Colombia. *Type*. (Greatly magnified.)

## Plate XVII

- Fig. 1.—*Platylestes colombiae* new genus and species. Dorsal outline of male. La Palmeta, Santander, Colombia. *Type*. ( $\times 2.5$ )
- Fig. 2.—*Platylestes colombiae* new genus and species. Ventral outline of distal portion of male abdomen. La Palmeta, Santander, Colombia. *Type*. ( $\times 12$ )
- Fig. 3.—*Neoblattella carrikeri* new species. Dorsal outline of male. San Lorenzo, Magdalena, Colombia. *Type*. ( $\times 2.5$ )
- Fig. 4.—*Neoblattella carrikeri* new species. Dorsal outline of apex of male abdomen. San Lorenzo, Magdalena, Colombia. *Type*. ( $\times 12$ )
- Fig. 5.—*Neoblattella carrikeri* new species. Ventral view of apex of male abdomen. San Lorenzo, Magdalena, Colombia. *Type*. ( $\times 12$ )
- Fig. 6.—*Neoblattella carrikeri* new species. Dorsal outline of female. San Lorenzo, Magdalena, Colombia. *Allotype*. ( $\times 2.5$ )

- Fig. 7.—*Lamproblatta albipalpus* new genus and species. Dorsal outline of male. Cincinnati, Magdalena, Colombia. *Type*. ( $\times 2$ )
- Fig. 8.—*Lamproblatta albipalpus* new genus and species. Lateral outline of male caudal tarsal joints. Cincinnati, Magdalena, Colombia. *Type*. ( $\times 7.75$ )
- Fig. 9.—*Lamproblatta albipalpus* new genus and species. Lateral outline of female caudal tarsal joints. Cincinnati, Magdalena, Colombia. *Allotype*. ( $\times 7.75$ )

## Plate XVIII

- Fig. 1.—*Epilampra shelfordi* new species. Dorsal view of male. El Credo, Cauca, Colombia. *Type*. ( $\times 2.5$ )
- Fig. 2.—*Pelmatosilpha micra* new species. Dorsal outline of male. La Palmeta, Santander, Colombia. *Type*. ( $\times 2$ )
- Fig. 3.—*Panchlora colombiae* new species. Ventral outline of apex of male abdomen. La Cumbre, Cauca, Colombia. *Type*. ( $\times 14.5$ )
- Fig. 4.—*Hormetica apolinari* new species. Dorsal view of male. Fusugasugá, Cundinamarca, Colombia. *Type*. ( $\times 1.5$ )
- Fig. 5.—*Acontiothespis iriodes* new species. Dorsal view of male. Santa Marta, Magdalena, Colombia. *Type*. ( $\times 1.5$ )
- Fig. 6.—*Pogonogaster latens* new species. Lateral outline of cephalic limb. Rio Aguatal, Cauca, Colombia. *Type*. ( $\times 4.5$ )
- Fig. 7.—*Pogonogaster latens* new species. Lateral view of abdomen. Rio Aguatal, Cauca, Colombia. *Type*. ( $\times 2$ )

## Plate XIX

- Fig. 1.—*Colapteroblatta compsa* new genus and species. Dorsal view of male. San Lorenzo, Magdalena, Colombia. *Type*. ( $\times 1.5$ )
- Fig. 2.—*Colapteroblatta compsa* new genus and species. Dorsal view of female. San Lorenzo, Magdalena, Colombia. *Allotype*. ( $\times 1.5$ )
- Fig. 3.—*Poroblatta apatela* new genus and species. Dorsal view of female. La Palmeta, Santander, Colombia. *Type*. ( $\times 1.5$ )
- Fig. 4.—*Poroblatta cylindrica* new genus and species. Dorsal view of female. Cincinnati, Magdalena, Colombia. *Type*. ( $\times 1.5$ )
- Fig. 5.—*Acroporoblatta adenophora* new genus and species. Dorsal view of female. Cincinnati, Magdalena, Colombia. *Type*. ( $\times 1.5$ )
- Fig. 6.—*Acroporoblatta adenophora* new genus and species. Cephalic outline of head and pronotum of female, showing swollen lateral wings of the latter. Cincinnati, Magdalena, Colombia. *Type*. ( $\times 2$ )
- Fig. 7.—*Hormetica apolinari* new species. Cephalic view of head and pronotum of male. Fusugasugá, Cundinamarca, Colombia. *Type*. ( $\times 2$ )
- Fig. 8.—*Lobocneme colombiae* new species. Dorsal view of male. Santa Marta, Magdalena, Colombia. *Type*. ( $\times 1.5$ )
- Fig. 9.—*Lobocneme colombiae* new species. Lateral view of internal face of cephalic coxa of male. Santa Marta, Magdalena, Colombia. *Type*. ( $\times 2.75$ )

Fig. 10.—*Bacteria apolinari* new species. Lateral view of distal portion of male abdomen. Susumuco, Cundinamarca, Colombia. *Type.* ( $\times 2$ )

Fig. 11.—*Bacteria apolinari* new species. Dorsal view of distal portion of male abdomen. Susumuco, Cundinamarca, Colombia. *Type.* ( $\times 2$ )

### Plate XX

Fig. 1.—*Acanthoclonia strangulata* new species. Dorsal view of female. San Lorenzo, Magdalena, Colombia. *Type.* ( $\times 2$ )

Fig. 2.—*Acanthoclonia strangulata* new species. Lateral outline of dorsum of female. San Lorenzo, Magdalena, Colombia. *Type.* ( $\times 2$ )

Fig. 3.—*Acanthoclonia strangulata* new species. Lateral outline of cephalic limb of female. San Lorenzo, Magdalena, Colombia. *Type.* ( $\times 2$ )

Fig. 4.—*Acanthoclonia carrikeri* new species. Dorsal view of male. La Palmeta, Santander, Colombia. *Type.* ( $\times 2$ )

Fig. 5.—*Acanthoclonia carrikeri* new species. Lateral outline of dorsum of male. La Palmeta, Santander, Colombia. *Type.* ( $\times 2$ )

Fig. 6.—*Anisomorpha atrata* new species. Dorsal outline of male. San Lorenzo, Magdalena, Colombia. *Type.* ( $\times 1.5$ )

### Plate XXI

Fig. 1.—*Stratocles viridis* new species. Dorsal view of female. Muzo, Boyaca, Colombia. *Type.* (Natural size.)

Fig. 2.—*Holcoides forceps* new genus and species. Dorsal view of head, pronotum, tegmina and proximal portion of wings of male. San Antonio, Cauca, Colombia. *Type.* ( $\times 3$ )

Fig. 3.—*Holcoides forceps* new genus and species. Dorsal view of distal portion of male abdomen. San Antonio, Cauca, Colombia. *Type.* ( $\times 3$ )

Fig. 4.—*Holcoides forceps* new genus and species. Lateral view of distal portion of male abdomen. San Antonio, Cauca, Colombia. *Type.* ( $\times 3$ )

Fig. 5.—*Pseudophasma taeniatum* new species. Dorsal view of female. San Antonio, Cauca, Colombia. *Type.* (Natural size.)

Fig. 6.—*Pseudophasma robustum* new species. Dorsal view of female. Cincinatti, Magdalena, Colombia. *Type.* (Natural size.)

### Plate XXII

Fig. 1.—*Pseudophasma eupeplum* new species. Dorsal view of female. La Palmeta, Santander, Colombia. *Type.* (Natural size.)

Fig. 2.—*Planudes cortex* new species. Dorsal view of male. Villa Eloira, Cauca, Colombia. *Allotype.* (Natural size.)

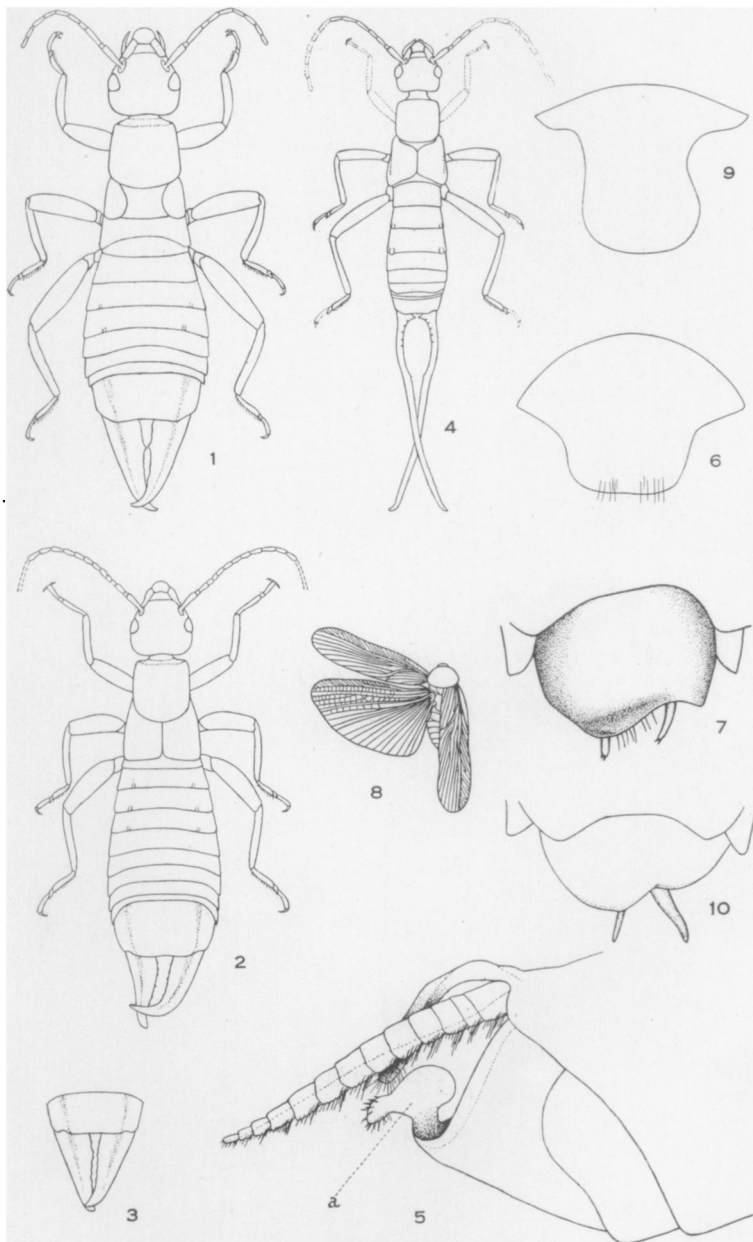
Fig. 3.—*Planudes cortex* new species. Dorsal outline of female. San Antonio, Cauca, Colombia. *Type.* (Natural size.)

- Fig. 4.—*Planudes cortex* new species. Lateral outline of cephalic limb of female. San Antonio, Cauca, Colombia. *Type*. ( $\times 1.5$ )
- Fig. 5.—*Bostra colombiae* new species. Dorsal view of distal portion of male abdomen. San Antonio, Cauca, Colombia. *Type*. ( $\times 3$ )
- Fig. 6.—*Bostra colombiae* new species. Lateral view of distal portion of male abdomen. San Antonio, Cauca, Colombia. *Type*. ( $\times 3$ )

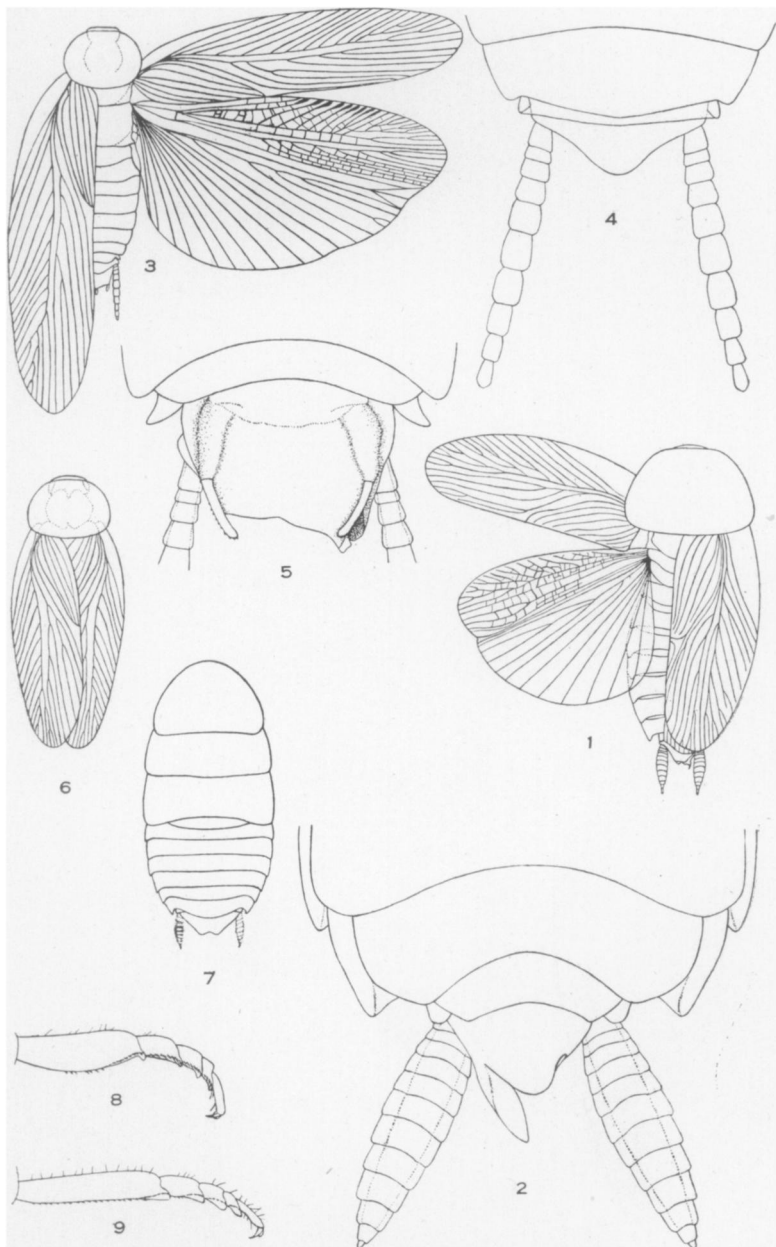
## Plate XXIII

- Fig. 1.—*Libethra spinicollis* new species. Dorsal view of female. San Antonio, Cauca, Colombia. *Type*. (Natural size.)
- Fig. 2.—*Libethra spinicollis* new species. Lateral outline of dorsum of female. San Antonio, Cauca, Colombia. *Type*. (Natural size.)
- Fig. 3.—*Libethra insalubris* new species. Dorsal view of female. Pueblo Nuevo de Ocaña, Santander, Colombia. *Type*. (Natural size.)
- Fig. 4.—*Libethra strigiventris* (Westwood). Dorsal view of distal portion of male abdomen. San Antonio, Cauca, Colombia. ( $\times 3$ )
- Fig. 5.—*Libethra strigiventris* (Westwood). Lateral view of distal portion of male abdomen. San Antonio, Cauca, Colombia. ( $\times 3$ )
- Fig. 6.—*Libethra strigiventris* (Westwood). Ventral view of female operculum. San Antonio, Cauca, Colombia. ( $\times 3$ )
- Fig. 7.—*Libethroidea inusitata* new genus and species. Lateral view of distal portion of female abdomen. Altas de las Cruces, near San Antonio, Cauca, Colombia. *Type*. ( $\times 3$ )
- Fig. 8.—*Libethroidea inusitata* new genus and species. Ventral view of female operculum. Altas de las Cruces, near San Antonio, Cauca, Colombia. *Type*. ( $\times 3$ )
- Fig. 9.—*Litosemyle ocanae* new genus and species. Lateral view of distal portion of female abdomen. Pueblo Nuevo de Ocaña, Santander, Colombia. *Type*. ( $\times 3$ )
- Fig. 10.—*Litosemyle ocanae* new genus and species. Ventral view of female operculum. Pueblo Nuevo de Ocaña, Santander, Colombia. *Type*. ( $\times 3$ )

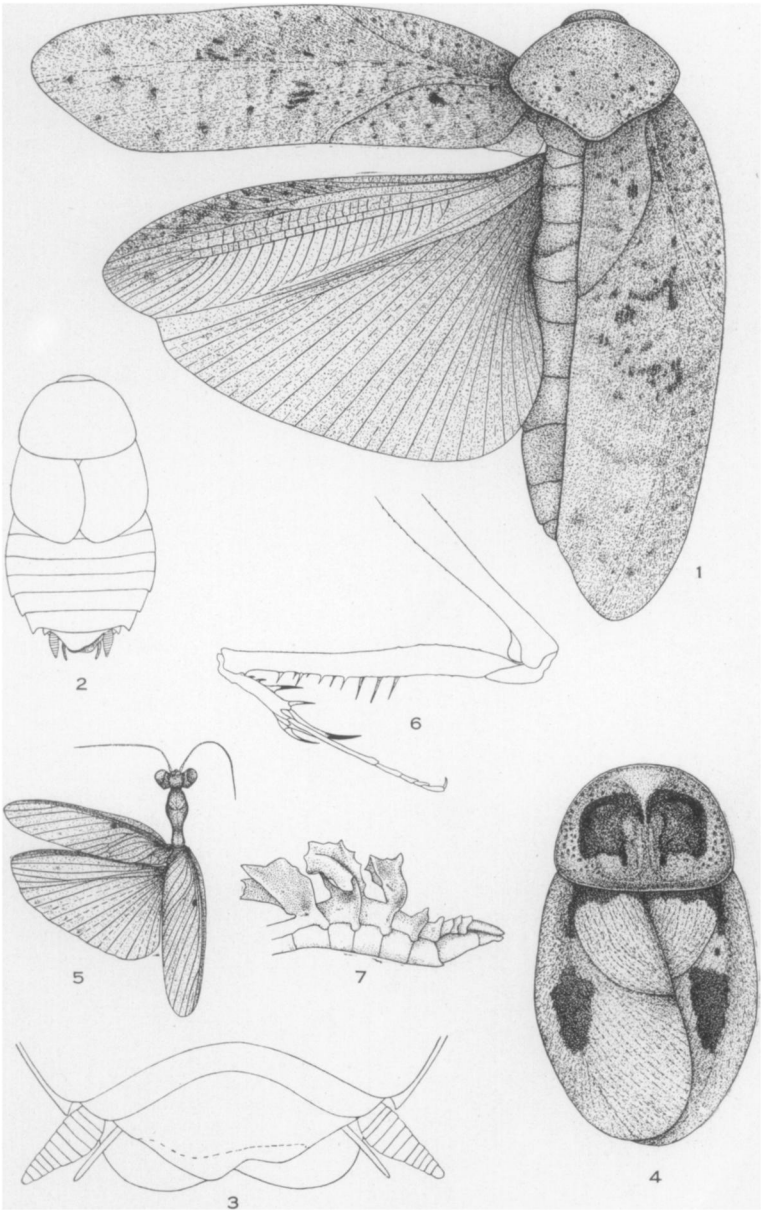




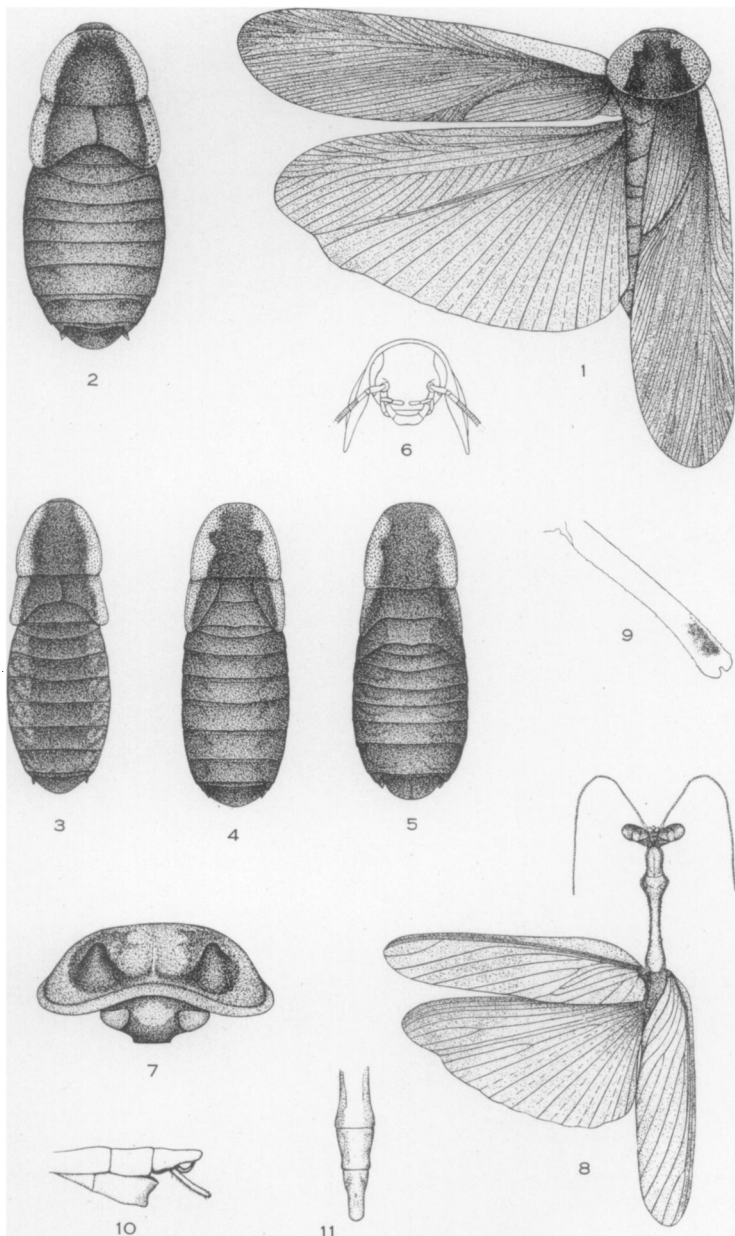
HEBARD—COLOMBIAN DERMAPTERA AND ORTHOPTERA



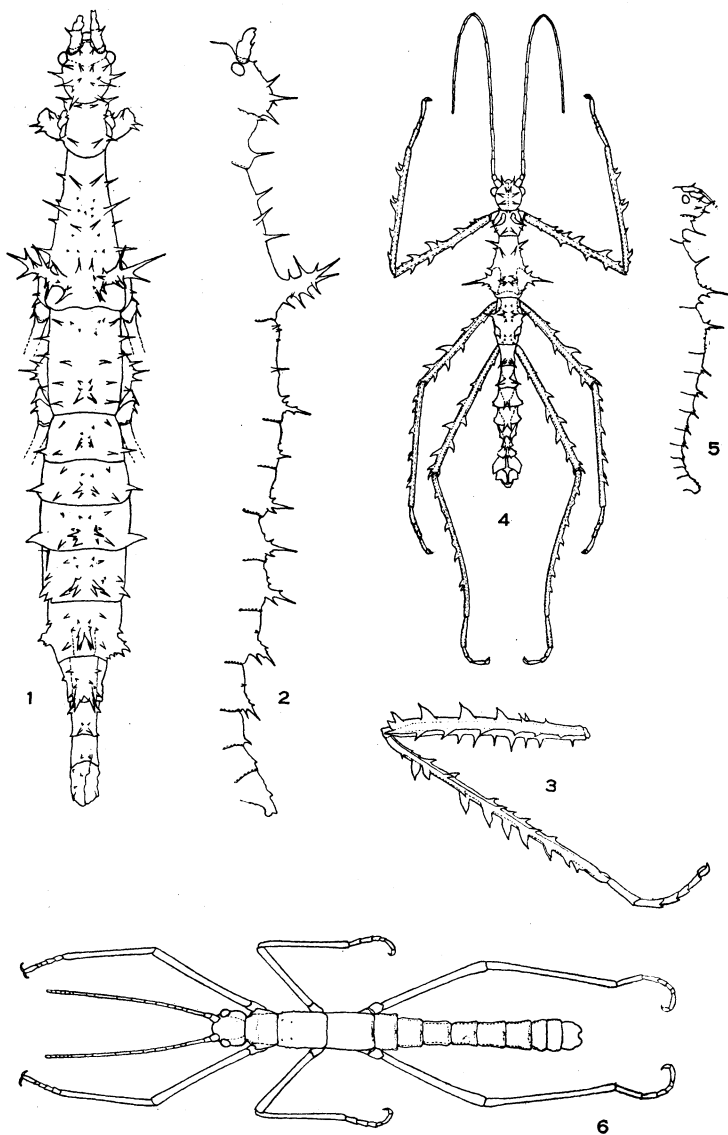
HEBARD—COLOMBIAN DERMAPTERA AND ORTHOPTERA

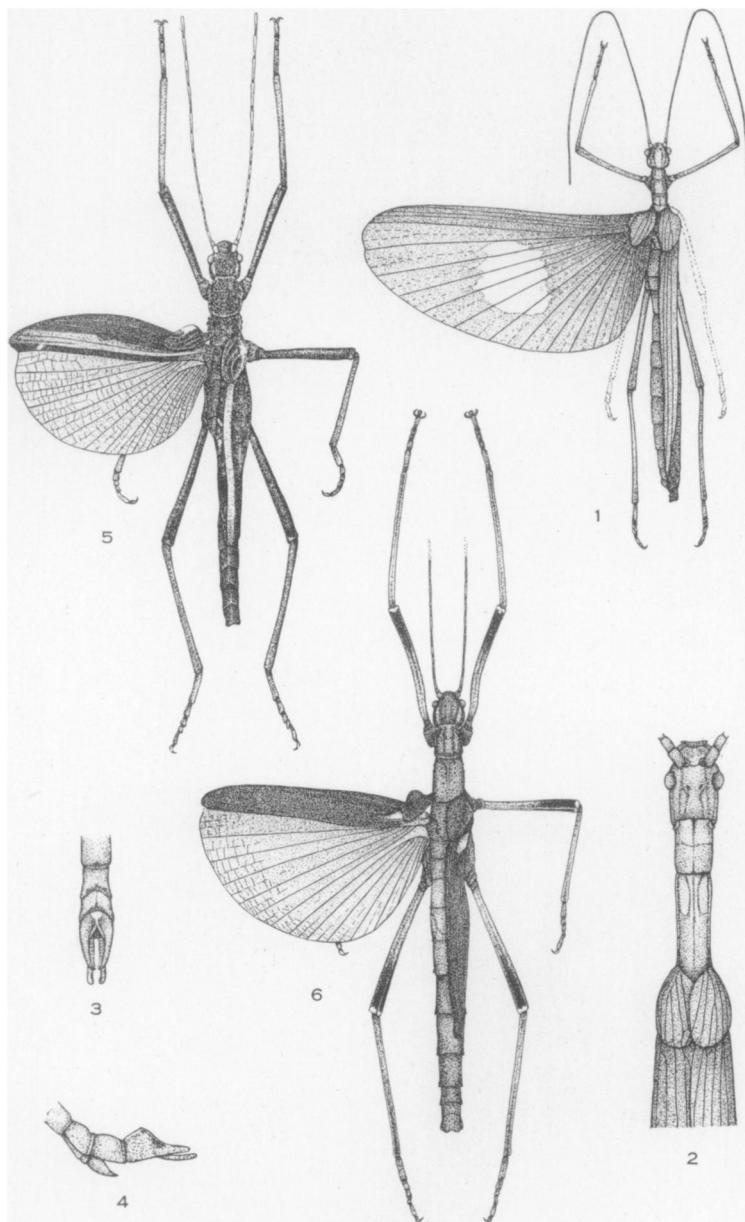


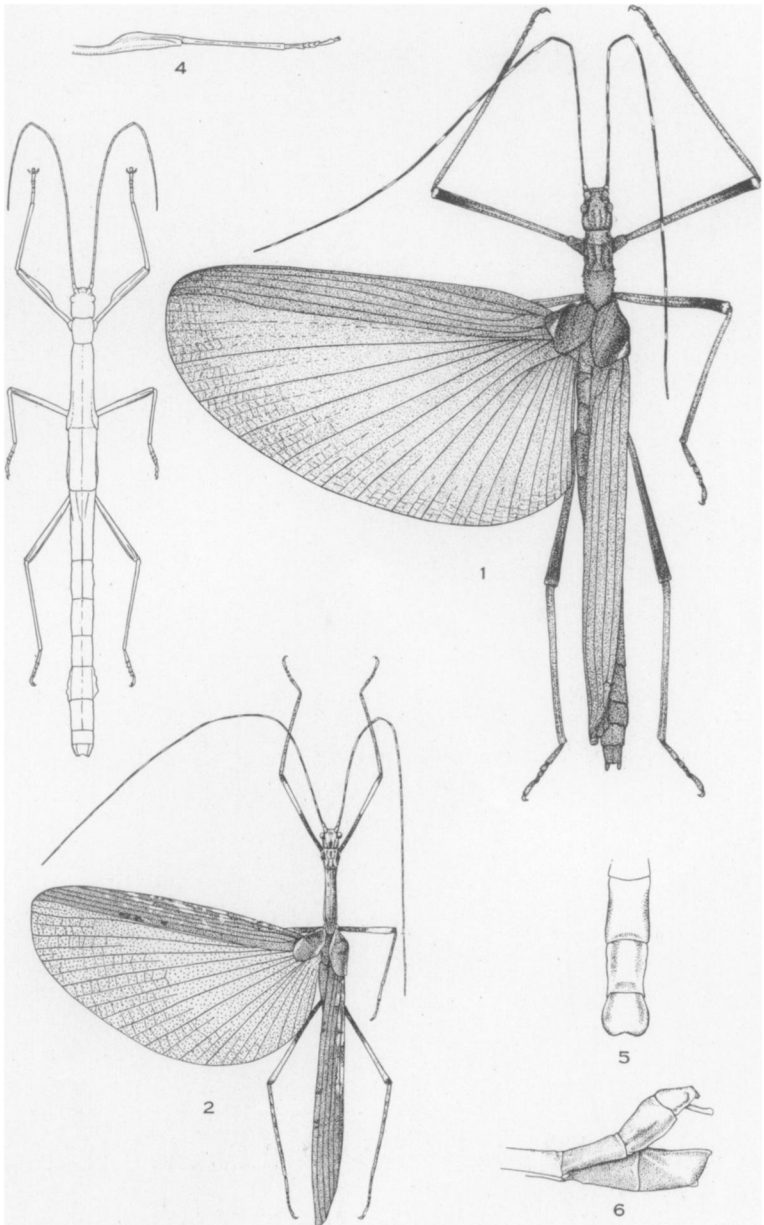
HEBARD—COLOMBIAN DERMAPTERA AND ORTHOPTERA



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